Annex A

CCGS Pierre Radisson-Refit fall 2020
CCGS Pierre Radisson
F3065-202250

DATES: Fall 2020

Original Version
September 11th, 2020

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G 1.0 GENERAL NOTES

G 1.1 Vessel Particulars

G 1.1.3 **Details**

Name:	CCGS Pierre Radisson
Type:	Medium Icebreacker / fluvial
Class:	Type 1200
Year Built:	1978
Yard	Burrard Dry dock, Vancouver, B-C
Principle Dimensions:	
Length:	98.2 m
Breadth, molded:	19.5 m
Loaded Draft:	7.2 m
Tonnage, displ:	1678.8 TM
Power	13 2000 KW
Propulsion	Diesel electrique

G 1.1.4 **Equipment[– Not Used]**

G 1.2 References

G 1.2.1 Acts, regulations, standards, publications and procedures

G 1.2.1.1 The latest edition, at the time of contract signing, of all Acts, regulations, standards, publications, and procedures listed below are to be used as reference. The Contractor will ensure all work completed in the specification are done to all pertinent federal and territorial regulations and standards. CCG procedures are to be used as a guide if no other regulation takes precedence.

FSM Procedures	Title	Included Yes/No
DFO/5737	Fleet Safety Manual (Latest Edition)	Yes
7.A.1	Assessing Risk	Included CCG/5737
7.A.10	Handling and Containing Asbestos Materials	Included CCG/5737
7.A.12	Potable Water Quality	Included CCG/5737
7.B.1	Diving Operations	Included CCG/5737
7.B.2	Fall Protection	Included CCG/5737
7.B.3	Entry Into Confined Spaces	Included CCG/5737
7.B.4	Hotwork	Included CCG/5737
7.B.5	Lockout and Tagout	Included CCG/5737
7.B.6	Electrical Safety – Working on Energized Electrical Conductors or Circuit Parts	Included CCG/5737
7.E.5	Handling, Storage, and Disposal of Hazardous Materials	Included CCG/5737
7.E.8	Use of Halocarbons	Included CCG/5737
10.A.6	Paint and Other Coatings	Included CCG/5737
10.A.7	Contractor Safety and Security	Included CCG/5737
171-09529-52	Gestion des matières dangereuses	Yes
5323-2020-13	COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels	Yes
5404-2020-08	COVID-19 - Information Concerning the Use of Non-medical Masks at Work	Yes
6102-515	Issuance of Contractor Designation Letters during the COVID-19 pandemic	Yes
Publications		
TP 3177	Standard for the Control of Gas Hazards in Vessels to be repaired or altered	No
TP 127 E	Ships Electrical Standards (2018)	No

NFPA 306 2014	Standard for the Control of Gas Hazards on Vessels	No
TP 14231	Marine Occupational Health and Safety Program	No
TP 14612	Procedures for Approval of Life-saving Appliances and Fire Safety Systems, Equipment and Products	No
IEEE45	Institute of Electrical and Electronics Engineers, Recommended Practice for Electrical Installations on Shipboard	No
70-000-000-EU-JA-001	Specification for the Installation of Shipboard Electronic Equipment	Available at: CCG/ITS
Report EPS 1/RA/2	Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems	No
NFPA 10	Standard for Portable Fire Extinguishers	No
18-080-000-SG-003	Paints and Coatings Standard (formerly DFO/5884 – TP 12445F)	No
Circular 1206	Measures to Prevent Accidents with Lifeboats (IMO/MSC)	No
Standards		
CSA W47.1	Certification of Companies for Fusion Welding of Steel Structures Division 2 Certification	No
CSA W47.2	Certification of Companies for Fusion Welding of Aluminum	No
CSA W59	Welded Steel Construction – Metal Arc Welding	No
CSA W59.2	Welded Aluminum Construction	No
ISO 9712:2005	International Standards for NDT	No
CT-043-EQ-EG-001-E	Welding Specification http://intra.coast-guard.ca/folios/00922/docs/WeldingSpecification-eng.pdf	Available at: CCG/ITS
ISO 8501-1:2007	Preparation of steel substrates before application of paints and related products	No
IACS No. 47 – Part "B" –	Shipbuilding and Repair Quality Standard	
Acts (Laws)		
S.C. 2001, c. 26	Canada Shipping Act	No
R.S.C., 1985, c. L-2	Canada Labour Code	No
Regulations		

SOR/2010-120	Maritime Occupational Health and Safety Regulations	No
SOR/90-264	Marine Machinery Regulations	No
SOR/2017-14	Vessel Fire Safety Regulations	No
C.R.C., c. 1432	Hull Inspection Regulations	No
SOR/2003-289	Federal Halocarbon Regulations, 2003	No
SOR/87-183	Marine Occupational Safety and Health Regulations	No
IMO Circ. 1432	Revised guidelines for the maintenance and inspection of fire protection systems and appliances	No

G 1.2.2 **Guidance Drawings**

G 1.2.2.1 The following Drawingsare to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Numéro de dessin	TITRE DU DESSIN	Nombre de feuilles
NT-2757-19-DE502A-(APP-INFO)	Remplacement antenne renforts sous le mât avant	
06418-20	Plan de lutte contre les incendies	
F-3756-06M008.pdf DWG #3	Installation des systèmes d'extinctions CO_2 (2008)	
F-3756-06M008-001-QCC.pdf	Système d'extinction au CO_2	
	08-Système d'extinction fixe	
221-661-2_02	Arrangement sprinkler system	1
	Sprinkler photos accompagnement	
171-09529-52	Gestion des matières dangereuses	114
141_19427_24_F1_F13	Devis désamiantage- NGCC Pierre Radisson WSP	13
141-_19427_24_information identification	Identification sommaire des calorifuges contenant de l'amiante NGCC Pierre Radisson	8
Puits de drainage réservoir journalier_jB	CCGS Pierre Radisson bilge well daily F.O. Tank (port side) strip out, location and fabrication details rev 01	1
C17-66-620-11 R1	Capacity plan rev 1	
19077-503-A-045	Battery & Survival Suit Room Arrangement	
19077-503-S-055	Passageway Bulkhead Modification	
19077-503-A-056	Fire Zone Arrangement	
19077-503-A-057	Relocation & Foundations	

221-H101_3	Arrangement généraux – Pont supérieur, pont principal Rev I	
221-H-80_1	Insulation Plan at superstructure Decks Rev D	1
221-H-80_2	Insulation Plan at Upper Deck & Main Deck & 17.0' flat. Rev D	1
DCC 2019-3427	Proposition W.C. #651 Assistants mécaniciens rev 1	1
221-H-80_1	Insulation Plan at superstructure Decks Rev D	1
221-H-80_2	Insulation Plan at Upper Deck & Main Deck & 17.0' flat. Rev D	1
DCC 2019-3427	Proposition W.C. #604 Assistants mécaniciens rev 1	1
Référence drain d'envol	Référence drain d'envol.pdf	
222-H-101	Arrangement général	3
74-1004_03	Firedoor class « A-60 » with (3) point latch bolt	
221-H-78_02	Door Schedule at upper & main dks @ 17'-0'	

G 1.2.3 **Tanks**

G 1.2.3.1 Listed are the tanks found on board, their Location by frame number and capacity (Where available). These are to be used as reference only and will not supersede any specification.

COM PARTM EN T	FRAM ES	CAPACITY (m^3)
OIL FU EL		
NO. 1 D.B OIL FU EL P.	123 - 165	91.2
N O. 1 D.B OIL FU EL S.	123 - 165	95.3
NO. 2 D.B OIL FU EL P.	97 - 123	102.6
N O. 2 D.B OIL FU EL S.	97 - 123	113.0
N O. 3 D.B OIL FU EL P.	61 - 23	141.2
NO. 3 D.B OIL FU EL S.	61 - 23	141.2
FW D. CENTRE OIL FUEL DEEP TANK P.	146 - 165	139.8
FW D. CENTRE OIL FUEL DEEP TANK S.	146 - 165	139.8
OIL FU EL DAY TANK	123 - 127	42.7
OIL FU EL SETTLING TANK P.	123 - 127	70.1
OIL FU EL SETTLING TANK S.	123 - 127	70.1
FW D. LOWER OIL FUEL W ING TANK P.	138 - 158	55.0
FW D. LOWER OIL FUEL W ING TANK S.	138 - 158	55.0
AFT . OIL FUEL DEEP TANK P.	18 - 30	104.0
AFT . OIL FUEL DEEP TANK S.	18 - 30	104.0
FW D. ENGINE R. OIL FUEL WING TANK P.	95 - 123	107.7

W ATER BALLAST (S.W .)		
FORE PEAK W .B . TANK	83 - FWD	112.3
AFT PEAK W .B . TANK	AFT	101.3
FWD TRIM T ANK	176 - 183	181.8
AFT TRIM T ANK	0 - 18	113.5
HEELING TANK W ORKING LEVEL P.	138 - 165	101.5
HEELING TANK W ORKING LEVEL S.	138 - 165	105.6
HEELING TANK FU LL P.	138 - 165	200.5
HEELING TANK FU LL S.	138 - 165	211.8
FLUME TANKS (S.W .)		
FLUM E T ANK U PPER FULL	127 - 138	268.0
FLUM E T ANK U PPER W ORKIN G LEVEL	127 - 138	188.3
FLUM E T ANK LOW ER FU LL	127 - 138	275.8
FLUM E T ANK LOW ER W ORKIN G LEVEL	127 - 138	131.8
FLUME T ANKS (O.F.)		
FLUME T ANK U PPER FULL	127 - 138	255.7
FLUM E T ANK U PPER W ORKIN G LEVEL	127 - 138	189.0
FLUM E T ANK LOW ER FU LL	127 - 138	262.3
FLUM E T ANK LOW ER W ORKIN G LEVEL	127 - 138	132.0

FW D. ENGINE R. OIL FUEL WING TANK S.	95 - 123	107.7
AFT. ENGINE R. OIL FUEL WING TANK P.	61 - 95	133.9
AFT . ENGINE R. OIL FUEL WING TANK S.	61 - 95	133.9
HELICOPTER FUEL TANK	4 - 11	28.3
LUB OIL		
LUBE OIL STORA GE TANK INNER	114 - 123	9.8
LUBE OIL STORA GE TANK OUTER	114 - 123	9.8
LUBE OIL STORA GE	30 - 34	3.7
LUBE OIL STORA GE	34 - 38	3.7
FRESH WATER		
FEED WATER TANK P.	27 - 30	16.4
FEED WATER TANKS.	27 - 30	16.4
FRESH WATER TANK P.	13 - 27	68.8
FRESH WATER TANK S.	13 - 27	68.8

BOILER FUEL OIL TANK	84 - 87	2.91
PURI FIER L.O. STORAGE	109 - 112	2.89
SLUDGE TANK	107 - 115	1.82
BOILER FEED TANK	95 - 100	4.55
HELICOPTER FUEL SUMP TANK	13 - 16	0.14
LUB OIL TANK	103 - 104	0.23
LUB OIL TANK	104 - 105	0.23
LUB OIL TANK	83 - 84	0.23
LUB OIL TANK	84 - 85	0.23
LUB OIL TANK	85 - 87	0.23
EM ERGY. GENER ATOR F.O.TANK	72 - 76	3.86
GREY WATER RETENTION TANK	142 - 144	0.45
PROP M OTOR L.O. CIRC. TANK	40 - 43	0.45
PROP M OTOR L.O. CIRC. TANK	40 - 43	0.45
HOT F.W . HEADER TANK	102 - 104	0.21
DIRTY LUB OIL TANK	112 - 116	4.77
BILGE RETENTION TANK	116 - 120	4.55
D.B. #4 BILGE RETENTION P.	30 - 61	64.6
D.B. #4 BILGE RETENTION S.	31 - 61	63.2

G 1.2.4 **Abbreviations**

ACM: Asbestos Containing Material	MCA: Matériaux contenant de l'amiante
CFM: Contractor Furnished Material and/or Equipment	MFE: Matériel fourni par l'entrepreneur
CLC: Canada Labour Code	CCT: Code canadien du travail
CSA: Canadian Standards Association	CSA: Association canadienne de normalisation - ACNOR
CWB: Canadian Welding Bureau	BCS: Bureau canadien du soudage
DFO/CCG: Department of Fisheries and Oceans, Canadian Coast Guard	MPO/ GCC: Ministère des Pêches et des Océans, Garde côtière canadienne
FSR: Manufacturer's Field Service Representative	RSF: Représentant de service du fabricant
FSM: Fleet Safety Manual	MSF: Manuel de sécurité de la Flotte
GSM: Government Supplied Material and/or Equipment	MFG: Matériel fourni par le Gouvernement
HC: Health Canada	SC: Santé Canada
IEEE: The Institute of Electrical & Electronic Engineers Inc.	IEEE: Institute of Electrical and Electronic Engineers
MSDS: Material Safety Data Sheet	FS: Fiche signalétique
NDT: Non Destructive Testing	END: Essais non destructifs
OEM: Original Equipment Manufacturer	FEO: Fabricant d'équipement d'origine
OHS: Occupational Health and Safety	SST: Santé et sécurité au travail
PWGSC: Public Works and Government Services Canada	TPSGC: Travaux publics et Services gouvernementaux Canada
RO: Recognized Organization as defined by Canada Shipping Act.	OR: organismes reconnus par la Loi sur la marine marchande du Canada
SSMS: Safety and Security Management System	SGSS: Système de gestion de la sécurité et de la sureté

TBS: Treasury Board of Canada Secretariat	SCT: Secrétariat du Conseil du Trésor du Canada
CA : Contract Authority - PSPC	AC : Autorité contractuelle - SPAC
TA: Technical Authority -CCG Superintendent, Marine Engineering Western Region, or her delegated Representative.	AT: Autorité technique – Représentant du propriétaire (GCC)
TCMS: Transport Canada Marine Safety	SMTC: Sécurité Maritime de Transports Canada
TI: Technical Inspector – CCG delegated.	AI: Autorité de l'Inspection – Inspecteur technique (GCC)
VCS: Vessel Condition Survey	DCC: Demande de Changement de Configuration
VLE: Vessel Life Extension	PVN: Prolongement de vie d'un navire
WCB: Workers' Compensation Board	CNESST: Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)
WHMIS Workplace Hazardous Materials Information System	SIMDUT: Système d'information sur les matières dangereuses utilisées au travail

G 1.3 Conditions and Definitions

G 1.3.1 General

G 1.3.1.1 The following conditions and definitions are applicable to all work contained in the Specifications and are intended to outline the quality of workmanship and practice that is the minimum acceptable level:

a) The word "install" means that the contractor must connect mechanically and electrically, and provide the labor and material to complete the installation;

b) The word "reinstall" means a piece of equipment that the contractor has affected repairs on and is to be returned/installed in its original location and be mechanically and electrically connected. The contractor must provide the labor and material to complete the reinstallation;

c) The word "remove" means that the contractor must provide all labor and material to remove the unit, equipment, material, or system in its entirety. Part of the removal process is to blank openings, restore insulation and paint;

d) The word "relocate" means that the contractor must provide all labor and material to remove the unit, piece of equipment, or system and to install the same unit, piece of equipment, or system in the new location;

e) The term "or equivalent" means a substitute which has equal characteristics (i.e. size, material type, life, weight, input, and output) as approved by the TA. A comparison of the general specifications must be provided to the TA for the equipment specified and the "or equivalent" (i.e. old compared to the new);

f) The term "overhaul" as applied to any mechanical equipment, structure or system comprises: disassembly into component parts, cleaning examination of parts for defects, gauging of parts for wear, reporting of parts worn beyond specification limits or otherwise defective and reassembly followed by specification adjustments, tests, and functional trials;

g) The word "disconnect" means the contractor must mechanically and electrically disconnect the piece of equipment of all piping, wiring, seatings and other attachments permitting the removal of the unit as a whole;

h) The word "disassemble" means that the contractor must provide all labor to take apart, piece by piece, the equipment, machinery or system to be examined or repaired;

i) The word "reassemble" means that the contractor must provide all labor and material to put together, piece by piece, the equipment, machinery or system on completion of examination or repair;

j) The words "Additional Work Procedures" means the procedures as defined in solicitation and contract include any additional work required on a system, sub-system or equipment which the original specification did not specify;

k) The word "calibrate" means the adjustment of readings and measurements to a known standard;

l) The word "check" means that the contractor must provide labor to find faults by sighting, feeling or listening. The checking of any equipment does not involve the disturbance or removal of parts, components or sub-assemblies;

m) The word "examine" means that the contractor must provide labor for the process of systematically examining, checking and testing equipment, records or administrative procedures to detect actual or potential defects or errors;

n) The word "test" means that the contractor must provide labor to conduct the operation of a unit in relation to a stated standard or procedure;

o) The words "set-to-work" means the tuning, alignment and adjustment of equipment/systems required subsequent to satisfactory installation. Inspection to make the equipment/systems ready for technical acceptance trials;

p) The word "trials" is an element of QA that means an action(s) by which the contractor proves by a visual or instrumental presentation that the equipment or system satisfies the requirements of the specified trials agenda;

q) The term "functional test" means operation of a piece of equipment in all its normal operating modes and throughout its operating range to establish that it will perform its designed function within normal operating parameters as indicated in the manufacturer's documentation.

G 1.3.1.2 For the duration of the work period, the vessel will be berthed at wharf 97 of the Canadian Coast Guard base located at 101Boul. Champlain, Quebec. Depending on the needs for diving the vessel may be moved for a period of time.

G 1.3.1.3 Space on the wharf is limited so the number of parking spaces for the contractor is limited and the contractor must provide shuttles and/or carpooling for their employees.

G 1.3.1.4 The Contractor must provide a list of employees and subcontractors to the Technical Authority prior to each working day to facilitate interactions at the security checkpoint. E-mail addresses of the list recipients will be given to the contractor at the beginning of the work period.

G 1.3.1.5 CCG Employees and Other Contractors on the Vessel

G 1.3.0.1 CCG and DFO employees and other employees, such as manufacturer's representatives, ABS investigators, may carry out other work on board the vessel, including work not mentioned in these specifications, during the work period. The TA will make every effort to ensure that other work, related inspections and investigations do not interfere with the Contractor's work. The Contractor must not coordinate or pay for any related inspections or inspection fees for this Work.

G 1.3.0.2 During the term of the Work, at least two other contracts will be performed concurrently with the Work described in this document. These two other contracts are :

a) Generator Engine Maintenance

G 1.3.0.3 The Contractor must not be responsible for the supervision or performance of the Work associated with these other contracts, nor for the supervision of subcontractors associated with these other contracts. The TA may, however, require a daily or weekly meeting in the presence of all contractors, including this Contract, to ensure proper coordination between the various projects underway on board the vessel.

G 1.4 Miscellaneous Provisions

G 1.4.1 COVID-19

G 1.4.1.2 Reference documents :

5323-2020-13	COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels
5404-2020-08	COVID-19 - Information Concerning the Use of Non-medical Masks at Work
6102-515	Issuance of Contractor Designation Letters during the COVID-19 pandemic

G 1.4.1.3 Due to the Covid-19 pandemic, the Contractor must comply with CCC 12-2020 "COVID-19 - Health Screening Questionnaire for Canadian Coast Guard Personnel and Visitors Accessing Canadian Coast Guard Facilities and Vessels" during an outbreak of an infectious disease such as Covid-19.

G 1.4.1.4 The Contractor must ensure that all its employees and subcontractors wear non-medical masks while on board the vessel. The Contractor must provide these masks to its employees and subcontractors. The Contractor must also provide hand sanitizer for use by employees and subcontractors.

G 1.4.1.5 Contractor Essential Service Letters will be issued in accordance with Procedure 515 if required for the prime contractor and any named subcontractors to facilitate travel and work.

G 1.4.2 **Occupational Health and Safety**

G 1.4.2.1 The Contractor and all sub-contractors must follow Occupational Health and Safety (OHS) procedures in accordance with applicable federal and provincial OHS regulations ensuring that Contractor activities are carried out in a safe manner and do not endanger the safety of any personnel.

G 1.4.2.2 Where "Safety Management System" is referenced in this document, it is referring to the Contractor's Safety Management System, which must be in affect while in the Contractor's Care and Custody and must be in accordance with the applicable OHS regulations and procedures.

b) The Contractor must, for all work on Canadian Coast Guard Vessel, meet or exceed the Safety Management System defiend in the FSM unless a Contractor propsed comprehensive Safety Management System is presented and accepted by the TA.

G 1.4.1.6 When the Contractor works on the vessel while in the Care and Custody of the Canadian Coast Guard, the Safety Management System of CCG must be followed:

a) Contractor and all its representatives must attend an orientation session on vessel safety before beginning any work to familiarize the Contractor's employees with the dangers specific to the vessel and with its permit systems for work protocols as well as with the procedures for safety, risk prevention, hazard response and pre-work safety assessments.

b) The Contractor will have access to an uncontrolled copy of the Fleet Safety and Security Manual.The Contractor must comply with the Fleet Safety Manual (DFO/5737), as well as with the instructions for working on board the vessel, in addition to the relevant requirements of the Canada Labour Code during performance of the following types of work:

i) Work at heights;

ii) Entry into enclosed spaces;

iii) Degassing before entering into confined spaces and for hot work;

iv) Lockout and Tagout;

v) Pre-work safety assessments.

c) For the purpose of the Lockout and identification procedure, the Contractor must provide the padlocks and locking devices for the Contractor's employees in addition to those provided by the Chief Engineer for the vessel's crew.

d) The Contractor must adhere to local facilities shore based safety instructions and safety procedures.

G 1.4.1.7 The Contractor must identify a specified person that is responsible for the safety management of the work site. The Safety Manager must insure that daily safety

rounds are carried out and that safety issues are identified and safety precautions are maintained.

G 1.4.1.8 Areas that pose a hazard as a result of the specification work are to be secured and clearly identified by the Contractor with signage to advise and protect all personnel from the hazard in accordance with applicable regulations.

G 1.4.1.9 The Contractor and its employees will not have access to the ships washrooms or crew lounges. The Contractor must provide the necessary facilities for its employees and subcontractors as required.

G 1.4.1.10 During the period of work, the contractor will be responsible for the maintenance of the areas of the ship that his personnel uses to access the work areas. Areas should be clean and free of debris, and garbage should be removed daily.

G 1.4.1.11 At the end of this contract, the Contractor must ensure that all waste produced as a result of the work of this specification is disposed of and that the vessel is as clean as it was before the beginning of the period. of the contract.

G 1.4.1.12 Once all known work has been completed and final cleaning has been completed, the Contractor's Quality Assurance Representative will be required to visit all areas of the vessel where work has been completed by the Contractor. Any deficiencies or damage noted must be recorded and compared to the photographs taken to determine if the deficiency or damage arises from the work performed by the Contractor. If this is the case, the damage must be repaired by the contractor at no cost to the CCG.

G 1.4.3 **Lead Paint and Paint Coatings**

G 1.4.3.1 The Contractor must not use lead based paints.

G 1.4.3.2 CCG ships have been painted with lead based paints in the past and as a result some of the Contractor’s processes such as grinding, welding and burning may release this lead from the coatings. Canadian Coast Guard will provide copies of all available lead testing results. Reference

G 1.4.3.3 Reference: TB-BT-2020-03 Paint Containing Lead on CCG Vessels.

a) The Contractor must provide the Technical authority with a risk mitigation plan for each processs requiring to alter the paint on the vessel. The plan must be given in a written form before the start of the work

G 1.4.3.4 The Contractor must ensure that coatings in affected work areas are examined for lead content and that work is performed in accordance with applicable federal and provincial regulations.

G 1.4.3.5 N/A The Contractor must demonstrate product approval by Health Canada for Health Canada controlled hull paints and the Pest Management Regulatory Agency.

G 1.4.4 **Touch-up / Disturbed Paint**

G 1.4.4.1 The Contractor, at a minimum, must repair coating systems disturbed as a result of the specified work. Coating systems must be in accordance with the coating system of the vessel, and be applied in accordance with the paint manufacturer's recommended procedures.

G 1.4.4.2 The Contractor must prepare any new steel or steel affected to the standards of the paint manufacturer prior to painting.

G 1.4.4.3 Unless otherwise indicated, all new steel and / or steel affected must receive two coats of marine primer compatible with the ship's paint coating scheme.

G 1.4.5 **Asbestos Containing Materials (ACM)**

G 1.4.5.1 The Contractor must NOT use any asbestos containing material.

G 1.4.5.2 The Contractor will be supplied the most recent Asbestos Risk Assessment Report and Asbestos Management Plan by CCG.

G 1.4.5.3 Handling of any asbestos containing materials must be performed by trained personnel and/or a company certified in the removal of asbestos in accordance with Federal, Provincial/Territorial and Municipal regulations.

G 1.4.5.4 The Contractor must provide the TA with disposal certificates for all asbestos containing material removed from the vessel indicating that the disposal was in accordance with Federal, Provincial and Municipal regulations in effect.

G 1.4.5.5 The Contractor must provide an "Observation Report (OR)" with reference to any concerns or intentions in regards to asbestos containing materials not already specified. The Contractor is to identify any materials that are suspected to contain asbestos prior to any work being completed. Any approved work resulting from the OR will follow the Additional Work Procedures.

G 1.4.6 **Confined Spaces**

G 1.4.6.1 Entry into any confined space onboard the vessel during the contract period must be conducted in accordance with the safety management system as determined in the Pre-Work Meeting. In addition to those requirements, the Contractor must also conduct the following:

a) Have a qualified person issues a "Gas Free Certificate" for spaces that will be entered and post the certificate outside the entrance to the space. Certificates must specify, "Safe for persons" or "safe for hot work" as appropriate.
b) Provide copies of all certificates generated to the TA in accordance with the Documentation section of the General Notes.

G 1.4.6.2 The Contractor may request a list of the enclosed spaces of the vessel at the meeting preceding the refit.

G 1.4.7 **Hot Work**

G 1.4.7.1 All hot work conducted during the contract must be in accordance with the Safety Management System. In addition to the requirements of the Safety Management System the Contractor must as a minimum also:

a) Certify confined spaces affected by hot work as "safe for hot work" in accordance with the Confined Spaces section of the General Notes.
b) Remove all portable combustible materials from the vicinity, to a safe distance not less than two meters away;
c) Supply and install protective material to prevent the spread of sparks, protect electrical cables and other services;
d) Supply and post fire sentries in each space and in the adjacent space where welding, grinding, or burning is being carried out on bulkheads, deckheads or decks;
e) Supply and provide appropriate fire extinguisher(s) to the fire sentries and ensure each sentry is trained in the extinguisher's use. The fire sentry must maintain a watch in his designated area for a minimum of thirty (30) minutes after any hot work has been completed. The Contractor must record the sentry attendance time on all hot work permits indicating when hot work stopped, and time sentry left post;
f) Provide a copy of the site generated hot work permits to the TA in accordance with the Documentation section of the General Notes; Named in accordance with the specification item generating the required work.

G 1.4.8 **Work Aloft**

G 1.4.8.1 Any work aloft onboard the vessel during the maintenance/refit period must be conducted in accordance with the Safety Management System. Notices must be placed to prevent operation of Radars while personnel are working aloft on the mast or on the wheelhouse top.

G 1.4.9 **Electrical Equipment**

G 1.4.9.1 When working on electrically operated equipment, the Contractor must lock-out equipment in accordance with the Safety Management System, and as a minimum conduct the following::

a) Isolate the main power source and any alternative power source to the equipment;
b) Install Electrical lock-outs and place electrical caution tags on the main power source and any alternate power sources for the switches/disconnects supplying the equipment under maintenance;
c) Verify at the terminals to ensure power is not present.
d) Ensure the lock-outs and electrical caution tags remain in place until completion of all work.

G 1.4.9.2 The TA must be notified of all such ongoing work.

G 1.4.9.3 All electrical installations and repairs must be done in accordance with the latest revisions of TP127 - Electrical Standards of Transport Canada Marine Safety and of standard 45- Recommended Practice for electrical installation on ships – of the IEEE. Standard TP127 takes precedence over the IEEE standard.

G 1.4.9.4 All electronic equipment installations and repairs must be performed in accordance with the Canadian Coast Guard's Telecommunications and Electronics publication " Specification for the Installation of Shipboard Electronic Equipment ".

G 1.4.9 **Workplace Hazardous Materials Information System (WHIMS)**

G 1.4.9.1 The Contractor must provide the TA with Material Safety Data Sheets (MSDS) for all Contractor and sub-contractor supplied WHIMS controlled products. MSDS sheets are to be the formats requested in the Documentation section 0 of the General Notes.

G 1.4.9.2 All MSDS sheets must be maintained in accordance with OHS procedures.

G 1.4.9.3 The TA will provide the Contractor with access to MSDS sheets for all controlled products on the ship for all specified work items on request.

G 1.4.10 **Smoking in the Work Space**

G 1.4.10.1 The Contractor must ensure compliance with the Non-Smokers' Health Act. The Contractor must ensure that there is absolutely no smoking onboard the vessel by their employees, sub-contractors, including the employees of any sub-contractor.

G 1.4.11 **Contractor Furnished Materials (CFM) and Tools**

G 1.4.11.1 The contractor must ensure that all equipment is new and has never been used.

G 1.4.11.2 The Contractor must ensure replacement material such as jointing, packing, insulation, small hardware, oils, lubricants, cleaning solvents, preservatives, paints, coatings etc. are in accordance with the equipment manufacturer's drawings, manuals and/or instructions.

G 1.4.11.3 Where no particular item is specified or where substitution must be made, the Contractor must submit an Observation Report indicating the substitution or item not specified to the TA. The Contractor must provide information about materials used, certificate of grade and quality of various materials to the TA prior to use.

G 1.4.11.4 The Contractor must provide all equipment, devices, tools and machinery such as cranage, staging, scaffolding, hoarding, and rigging necessary for the completion of the work in this specification.

G 1.4.11.5 The Contractor must deliver and store all new CFM equipment at their facility. The CFM must be stored in a secure, environmentally controlled space in accordance with the equipment storage section of this specification.

G 1.4.11.6 All tools are Contractor supplied unless otherwise stated in the technical specifications.

G 1.4.12 **Government Supplied Materials (GSM) & Tools**

G 1.4.12.1 All tools must be provided by the contractor unless otherwise stated in the technical specifications.

G 1.4.12.2 Where tools are supplied by the TA they must be returned by the Contractor in the same condition as when they were borrowed. Borrowed tools must be inventoried and signed for by the Contractor on receipt and return to the TA.

G 1.4.12.3 The Contractor must retain all Government Furnished Goods in a secure atmosphere controlled warehouse or warehouse in accordance with the manufacturer's instructions.

G 1.4.12.4 Any GSM not specifically stated in the Technical Specification must be received by the Contractor and stored in accordance with the Equipment Storage section of this specification. These activities are to be covered by the Procedures for Design Change or Additional Work. (PWGSC 1379).

G 1.4.13 **Storage**

G 1.4.13.1 Equipment (i.e. covers, cowling and other items that may need to be removed and stored) must be stored in accordance with the equipment manufacturer’s or equipment vendor’s specific storage instructions. The Contractor must make these instructions available to the TA.

G 1.4.13.2 All equipment and items must be stored in such a manner so as to be easily accessible for inspection. No items are to be stored directly on floors.

G 1.4.14 **Regulatory Inspections and/or Class Surveys**

G 1.4.14.1 The Contractor must schedule and coordinate all regulatory inspections and classification investigations in collaboration with the appropriate authority, eg. eg, Transport Canada Marine Safety, Classification Society, Health Canada, Environment Canada or others, based on this specification.

G 1.4.14.2 Any documents produced as part of the inspections and investigations mentioned above and demonstrating that they have occurred (eg original signed and dated certificates) must be submitted to the TA.

G 1.4.14.3 The Contractor must not substitute inspection by the TA for TCMS regulatory inspections or classification surveys.

G 1.4.14.4 The Contractor must provide advance notice (not less than 24 hours) to the TA prior to TCMS regulatory inspections or scheduled classification surveys so that the TA can attend the inspection.

G 1.4.15 **Contractor Inspections**

G 1.4.15.1 The Contractor must afford the opportunity for the TA to conduct an inspection with the contractor on the condition and location of items to be removed prior to either carrying out the specified work or gaining access to a location to carry out the work.

G 1.4.15.2 The Contractor must take a before picture of conditions prior to removing any items. These photographs are to be in accordance with the Documentation section of the General Notes, named according to the specification section that resulted in removing those items.

G 1.4.15.3 Any damage resulting from the work of the contractor and attributable to the execution of the work by the latter must be repaired by him, at his expense. Equipment used for replacements or repairs must meet the criteria for Contractor supplied material as indicated in the Contractor Supplied Equipment and Tools section.

G 1.4.15.4 Contractor must protect equipment and adjacent areas from damage. Workplaces should be protected against water ingress, sanding and welding particles, etc. Temporary covers will have to be installed in the workplace.

G 1.4.15.5 Prior to the close out of any item under this specification, the Contractor must afford the TA the opportunity to verify the work has been completed in accordance with the specification. At that time the Contractor must have available all photographs, documents, reports, and trials in relation to the item being closed out as completed.

G 1.4.16 **Recording of Work in Progress**

G 1.4.16.1 The TA may record any work in progress using various means including, but not limited to, photography and video, digital or film.

G 1.4.17 **Access for Maintenance, Installation, and Removal.**

G 1.4.17.1 The Contractor must ensure that the CCG Technical Authority and personnel have unrestricted access to the workplace at all times throughout the duration of the contract.

G 1.4.17.2 All equipment removed as part of this specification remains the property of CCG, unless otherwise specified in certain sections of the specification.

G 1.4.18 **Restricted areas**

G 1.4.18.1 The Contractor must not enter any of the following areas (except to perform work as per specifications): cabins, offices, workshops, engineering office, wheelhouse, control room, washrooms, galley, crew stations, locations recreational areas and other areas where restricted access is indicated by signs.

G 1.4.18.2 The Contractor must give the TA 24 hours notice when working in occupied premises or offices. CCG will have sufficient time to move personnel and secure areas.

G 1.4.19 **Assembly of Components**

G 1.4.19.1 The Contractor must ensure that during installation of specified equipment, that parts and assembled equipment are cleaned of smudges, spatter or excess solder, weld metal and metal chips or any other foreign material which might detract from the intended operation, function, or appearance of the equipment. (This would include any particles that could loosen or become dislodged during the normal expected life of the equipment). All corrosive material must be removed. This cleaning must take place before the parts are assembled into the equipment.

G 1.4.19.2 Covers, cowlings and components damaged by the Contractor must be replaced with a new CFM cover, cowling, or component.

G 1.4.19.3 Where torque specifications are not provided by the manufacturer, the applicable SAE, ANSI, or BS1083 nut and bolt standard torque must be used.

G 1.4.20 **Protection of Equipment**

G 1.4.20.1 The Contractor must take measures to ensure that surfaces and components of equipment installed on the vessel are protected against damage, soiling, and contamination as a result of contracted work.

G 1.4.20.2 All electrical and electronic equipment and components must be protected during the contract against physical damage, internal damage, and by the effects of adverse temperatures or other environmental conditions.

G 1.4.20.3 The Contractor must protect equipment that could be damaged as a result of movement of materials and equipment nearby. The Contractor must also protect equipment from nearby sources of contamination including but not limited to burning, welding, media (sand) blasting, grinding and painting.

G 1.4.20.4 Any damage to surfaces, equipment, furnishings or decor incurred prior to acceptance must be returned to As-Delivered condition by the Contractor.

G 1.4.20.5 All openings in machinery and/or systems prior to connections being made must be kept covered by fitted secure solid inserts or covers at all times.

G 1.4.20.6 The Contractor must obtain and follow instructions from its sub-Contractors for any special protection required for their equipment during the project work. Such instructions must be made available to the TA.

G 1.4.20.7 Physical protection including but not limited to plastic sheets, fireproof covers, heavy weight material covers, wood plugs, wood encasements and heaters must be used as required.

G 1.4.20.8 The Contractor must protect the vessel from the possibility of vermin infestation (insect/mammal/bird). If an infestation does occur during the contract period, the Contractor must bear all costs to ensure the vessel is made vermin free before the vessel's departure and contract completion.

G 1.4.21 **Halocarbon containing Systems**

10.1.A.1 All work conducted on Halocarbon containing systems, must be in accordance with the Federal Halocarbon Regulations, 2003 (SOR/2003-289). These regulations are avalible on the internet here: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2003-289/page-1.html

G 1.4.22 **Welding**

G 1.4.22.1 In addition to section 7.16 Welding Certification – Contract; All welding and weld inspection must be in accordance with the CCG Welding Specification CT-043-eq-eg-001. This document will be provided to the Contractor within 48 hours of written request to the TA.

G 1.4.22.2 The governing standards for welding of materials less than 3 mm in thickness must be in accordance with the requirements of the CCG Welding Specification CT-043-EG-EQ-001. For materials greater than 3 mm in thickness, the Contractor must meet the following:

a) For structural steels greater than 3 mm in thickness, welding must meet the requirements of CSA Standards W47.1 and W59, except as modified by the CCG Welding Specification CT-043-EG-EQ-001.
b) For structural aluminum greater than 3 mm in thickness, welding must meet the requirements of CSA Standards W47.2 and W59.2, except as modified by the CCG Welding Specification CT-043-EG-EQ-001.
c) For structural stainless steels greater than 3mm in thickness, welding must meet the requirements of CSA Standard W47.1 and AWS D1.6, and of the CCG Welding Specification CT-043-EG-EQ-001.

G 1.5 Documentation

G 1.5.1 Text Documenation

G 1.5.1.1 All text deliverables must be accompanied by a PDF file that must contain the complete document. The Contractor must check the quality to verify that the content reflects the same content/formatting as the Master Document file. In the case of changes, a second PDF file that contains only the changed sheets must be supplied.

G 1.5.2 Data Book

10.1.A.1 The Contractor must provide all documentation generated as a result of specified deliverables, in both electronic and paper formats. There must be 2 paper copies of each document, in two separate binders, as part of the contractors QA program. An electronic copy of all documentation must also be provided to the TA in accordance with the formats described in this specification section.

G 1.5.2.1 All copies of documents generated as a result of specified deliverables will be referred to as the "Data Book".

G 1.5.2.2 The Contractor must provide to the TA all the files generated as part of the Data Book prior to the contract being considered complete. The files must be in hard format (CD-ROM, DVD-ROM, Flash Drive / Memory Stick). Each specification item is to have its own folder named according to the specification item. For example "G1.0 General Notes".

G 1.5.2.3 Any documentation, media, and reports that are the result of Additional Work must be included as part of the Data Book.

G 1.5.3 File Naming

G 1.5.3.1 The name of the files must include the number of the section of the specification to which it relates, the date and a short description of the content. (example: "G_1.0_2019-03-25_Types Description.pdf")

G 1.5.4 **E-mails**

G 1.5.4.1 All attached files sent to the TA and IA by email must comply with section G 1.5.3 File Naming of this Specification. The subject of emails containing attachments (deliverable) must contain the # contract - quote item # - date - keywords short description of the content.

G 1.5.5 **File Formatting**

G 1.5.5.1 All documentation, reports, test results, certificates, or data obtained by the contractor in paper form must be scanned into unprotected, searchable, Adobe PDF formatted files and named according to the File Naming section of this specification.

G 1.5.5.2 All reports, test results, certificates, or raw data obtained by the contractor in electronic format must be converted to unprotected Adobe PDF formatted files and named according to the "File Naming" section of this specification. Both the original and the converted copy must be provided as part of the Data Book.

G 1.5.6 **Photographs**

G 1.5.6.1 All photographs obtained by the contractor as requested in the specification must be provided in .JPG formatted files at a resolution of at least 640 x 480 and named according to the "File Naming" section of this specification.

G 1.5.7 **Measurements, Calibrations, and Readings.**

G 1.5.7.1 All measurements, calibrations and readings recorded, must be signed by the person taking the measurements, dated and scanned into electronic format as part of the Data Book.

G 1.5.7.2 Unless other wise specified the Contractor must record dimensions to a precision of three significant digits in imperial along with the metric equivalent.

G 1.5.7.3 The Contractor must provide to the TA current and valid calibration certificates, and control values for all instrumentation used in the Test and Trials Plan, showing that the instruments have been calibrated in accordance with the manufacturer's instructions. These copies are to be provided as part of the Data Book, under any specification where measurements are required.

G 1.5.8 **Test/Inspection Records and Certificates**

10.1.A.1 Test and/or Inspection Records and Certificates are identified as a deliverable in the individual specification item requesting them.

G 1.5.8.1 Test and/or Inspection Records and Certificates, must be included as a separate section in the Databook and indexed/arranged in numeric order by specification number.

G 1.5.8.2 The Contractor is responsible for maintaining a complete and accurate record of all tests and trials conducted on the vessel and on each piece of equipment. Prior to the commencement of a trial, all relevant documentation and associated test sheets, including shop test data, must be complete and attached to the trials agenda.

G 1.5.8.3 All tests and trials data must be legible both in hard copy and electronic format. If necessary, handwritten records may require transcription into electronic format in order to be acceptable. The original must be signed by the regulatory body, the TA, the Contractor and where necessary, by the sub-Contractors and/or FSR's who witnessed the tests. All the data must be submitted to the TA in accordance with the Documentation section of these General Notes.

G 1.5.8.4 The original records of tests, tests and inspections must be signed by TC, the contractor and, if applicable, the subcontractors or feild service representative who attended the tests.

G 1.5.8.5 The Contractor must provide, in paper (2 copies) and electronic format, all copies of the tests, trials and inspection logs.

G 1.6 Drawings

G 1.6.1 **General**

G 1.6.1.1 The Drawings section of the General Notes is intended to be used as a reference for minimum standards where specified deliverables must be drawings.

G 1.6.1.2 All drawings will be made on ANSI ANSI-size paper (11 "x 17") at least. The drawings will be sent in DWG format (AutoCAD 2013 or newer), on CD-ROM, and will not be protected by a password. One (1) CD-ROM must be provided.

G 1.6.2 **Guidance Drawings**

G 1.6.2.1 All technical guidance drawings are issued to the Contractor for guidance purposes only. It is the responsibility of the Contractor to develop working drawings and to ensure that all such drawings receive applicable regulatory approval. The Contractor is to note that not all technical guidance drawings supplied are As-Fitted drawings. It is the responsibility of the Contractor to physically verify all affected items.

G 1.6.2.2 All departures from the provided guidance drawings and project specifications must be clearly indicated by the Contractor and written approval obtained from the TA before carrying out such alterations or departures.

G 1.6.2.3 Specification deviations must be documented using an Observation Report.

G 1.7 Manuals

G 1.7.1 General

G 1.7.1.1 The "Manuals" section of the General Notes is intended for use as a reference for minimum standards where specified deliverables must be manuals.

G 1.7.1.2 Each instruction manual and register must be bound in a "D" 3-ring hard cover book with interlocking latches that can accommodate 8-1 / 2 "by 11" sheets. Larger drawings and documents must be accordion folded. The following information must be printed on the cover:

a) CCGS Radisson
b) Specification identification number
c) Identification of equipment or systems
d) manufacturer of the equipment;
e) revision number and date.

G 1.7.1.3 All sections of manuals must have laminated tabs. The main components of the equipment should be subdivided into separate sections in the manuals.

G 1.7.1.4 A main index should be at the beginning of each notebook and indicate all the elements included in each section.

G 1.7.1.5 A list of the names, addresses and telephone numbers of the equipment manufacturers' resource persons must accompany the document for reference after completion of the project for maintenance and information management purposes.

G 1.7.1.6 A copy of the final approved version of the "as-built" drawings must be included in the service manual.

G 1.7.1.7 The Contractor must provide the Technical Authority with two paper copies of all manuals and data sheets in English and French (one copy of each) of the equipment provided by the Contractor prior to the expiry of the Contract. .

G 1.7.1.8 The Contractor must provide four copies to the Technical Authority of all individual DVD manuals and data sheets, in PDF-compatible format, before the expiry of the contract.

G 1.7.2 **Operation Manuals – As-Fitted[– Not Used]**

G 1.7.2.1 [– Not Used]

G 1.7.3 **Maintenance Manuals – As-Fitted[– Not Used]**

G 1.7.3.1 [– Not Used]

G 1.8 Identification[– Not Used]

G 1.8.1 [– Not Used]

G 1.9 Production diagram

G 1.9.1 The purpose of this specification is to provide the owner's representatives with a clear schedule of work and completion for the needs of the Coast Guard.

G 1.9.2 The Contractor must provide a bar chart usig an application that shows the critical path (Ms Project 2010 format or equivalent) that illustrates the anticipated schedule of ship refit work. This chart should show each task in the specification with its start date, duration, and expected completion date.

G 1.9.3 Any critical work sequence must be indicated, with critical tasks likely to delay the refit if it does not meet the scheduled work schedule. These may be labor issues or tasks that can not be performed alongside other tasks.

G 1.9.4 In the event of work affecting the critical path of work, the TA, the IA and the CA are notified immediately. Every effort must be made not to delay the ship's refit. Regular quality assurance procedures must be applied.

G 1.9.5 The bar chart will be updated weekly and in advance of each production meeting to illustrate the actual progress of the refit work and the changes made to the completion date of each item. The Contractor must include in its chart updates any special work requested on PWGSC Form 1379 indicating the impact this additional work will have on the work schedule.

G 1.9.6 The Contractor must provide a pdf copy and a .mpp copy (MS Project 2010) or newer version of the Bar Chart to the TA and IA no later than three days after the date of contract award.

S 1.0 SERVICES

S 1.1 General

S 1.1.1 The Contractor is responsible for providing the Confined Space Rescue Service and Rescue Service at a height to intervene with these employees and subcontractors.

S 1.2 Cranes

S 1.2.1 Crane on board the vessel

a) The ship's crane will not be available for the Contractor’s purpose.

S 1.2.2 Contractor's crane

a) It is the responsibility of the contractor to verify the load restrictions applicable to the dock where the ship is moored. Lifting slings and equipment will be provided by the contractor.

S 1.3 Mooring Lines[– Not Used]

S 1.3.1 [– Not Used]

S 1.4 Gangways[– Not Used]

S 1.4.1 [– Not Used]

S 1.5 Electrical Power

S 1.5.1 120 VAC electricity and 120 psi compressed air will be provided by the vessel.

S 1.6 Protection of Decks and Lower Walls

S 1.6.1 In order to prevent encrustation of dirt in corridors and protect the floor covering, supply and install Masonite 1/8 "thick on the surfaces of internal bridges in the paths access to work from the outside door to the workplace.

S 1.7 Heating[– Not Used]

S 1.7.1 [– Not Used]

S 1.8 Worksite Inspections

S 1.8.1 Before the Contractor begins work on the vessel, the TA and the Contractor's Quality Assurance Representative must visit areas where work will be carried out, including access roads. The Contractor's Quality Assurance Representative must take digital photographs of each area to demonstrate compliance with the requirements of this document. He must then download these photos in JPG format on a CD or DVD. Each photo must be dated and indicate which location on the ship it is. Copies of the CD or DVD must be provided to the TA for reference within 48 hours of the start of the contract period.

S 1.8.2 During the construction period, the contractor will be responsible for the maintenance of the areas of the ship that his personnel uses to access the work areas. Areas should be clean and free of debris, and garbage should be removed daily.

S 1.8.3 Hazardous areas, due to the work provided for in this specification, must be secure and clearly identified by the contractor. Posters must be posted to inform and protect all staff in accordance with the applicable requirements of the Canada Labor Code.

S 1.8.4 At the end of this contract, the Contractor must ensure that all waste produced as a result of the work of this specification is disposed of and that the vessel is as clean as it was before the beginning of the period. of the contract.

S 1.8.5 Once all known work has been completed and final cleaning has been completed, the Contractor's Quality Assurance Representative will be required to visit all areas of the vessel where work has been completed by the Contractor. Any deficiencies or damage noted must be recorded and compared to the photographs taken to determine if the deficiency or damage arises from the work performed by the Contractor. If this is the case, the damage must be repaired by the contractor at no cost to the CCG.

S 1.9 Fire Protection

S 1.9.1 The Contractor must ensure that insulation, removal and installation of fire detection and suppression systems and related components are performed by a qualified technician. When fire detection or extinguishing systems are deactivated or decommissioned by the contractor during the term of the contract, a qualified technician must re-certify that they are fully functional. The original signed and dated certificate must be delivered to the Technical Authority (TA) and Technical Inspection before the end of the contract.

S 1.9.2 The Contractor must notify and obtain written approval from the Technical Inspection and the TA prior to disturbing, removing, isolating, deactivating,

decommissioning or locking any part of the detection and control systems. extinguishing fires, including heat and smoke detectors.

S 1.9.3 The Contractor must provide fire protection at all times and therefore also while work is being performed on the vessel's fire detection and extinguishing systems. This can be done as suggested below, only after obtaining the written approval of the TA:

a) Only disable one part of the system at a time;
b) Maintain the system operational using spare parts while the work is in progress;
c) Use other methods accepted and approved by the TA.

S 1.9.4 The Contractor must be aware that, if all necessary precautions are not taken when working on the ship's fire suppression systems, this could result in an accidental release of extinguishing agents. The contractor will then have to fill and certify, at his expense, containers or systems that have emptied due to such work.

S 1.10 Project Facilities[– Not Used]

S 1.10.1 [– Not Used]

10.0 Safety and Security

10.1 FIREFIGHTING SYSTEMS

10.1.A Scope

10.1.A.1 Perform maintenance and replacement of cylinder heads and actuators of the shipboard fire-fighting system in accordance with TC regulations.

10.1.B References

10.1.B.1 Equipment Data

10.1.B.1.1 The actuators in place in several areas of the vessel are of the following type Kidde fire system 82-878750-000.

10.1.B.2 Drawings

10.1.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
06418-20	Plan de lutte contre les incendies	
F-3756-06M008.pdf DWG #3	Installation des systèmes d'extinctions CO_2 (2008)	
F-3756-06M008-001-QCC.pdf	Système d'extinction au CO_2	
	08-Système d'extinction fixe	

10.1.B.3 Regulations and Standards

10.1.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
NFPA 12 (2018)	Standard on Carbon Dioxide Extinguishing Systems	Non
Regulations		

IMO Circ. 1432	Revised guidelines for the maintenance and inspection of fire protection systems and appliances	

10.1.C Statement of Work

10.1.C.1.1 The Contractor must replace 4 actuators for the CO2 system. The actuators currently used on board are Kidde 82-878750. The system must be certified by the contractor as being in compliance following the work. The 4 actuators to be changed are located on the Time Delay Module (Forward, Aft, Propulsion and Control). The Contractor must supply 4 new hoses identified with installation date.

10.1.C.1.2 he contractor must replace 4 cylinder heads that are currently from the Pyrene company in order to change the hoses between the heads and the manifolds.

10.1.C.1.3 The contractor must provide parts and service to replace the CO2 cylinder heads and hoses.

10.1.C.1.4 The cylinders are located in :

a) The ship's pump room

b) The cofferdam.

10.1.C.1.5 Check the correct operation of the cylinders on the systems undergoing work; timers, visual indications, audible alarms as well as shutdowns of the vessel's ventilation systems. The cylinders must be uncoupled to avoid accidental discharges. The ducts should be blown with dry air, nitrogen or some other inert gas.

10.1.C.1.6 The contractor must have at the start of each day sufficient full bottles to blow out the ducts for the duration of the inspection in order to avoid delays. The contractor must also have the manpower to reset the alarm system and test it at the same time. The contractor must agree the inspection period with the inspection authority.

10.1.C.1.7 Demonstrate that all nozzles and distribution ducts are clear of obstructions. These tests may require the dismantling and sealing of certain parts of the ducts. Each system must be returned (as far as possible) to its original state of good functioning once the tests are completed at the end of each day.

10.1.C.1.8 Check all on-site and remote operation devices, time delays as well as the temperature raise triggers.

10.1.C.1.9 Ensure the tightness and good condition of the flexible hoses connecting the cylinders to the distribution ducts.

10.1.C.1.10 The level of all cylinders in each system should be checked. A label must be affixed to each cylinder indicating its level.

10.1.C.1.11 It is agreed that fire equipment will be accessible and available in case of emergency and that appropriate precautions will be taken when hot work is performed in the area protected by the fixed extinguishing system.

10.1.C.1.12 Labels bearing the name of the contractor, the date and the initials of the person performing the inspection must accompany each system.

10.1.C.1.13 In cases where a fixed cylinder of extinguishing agent is found to be defective, under normal load, or where a hydrostatic test is required, the Contractor will be responsible for removing the cylinder, filling it, returning it to its original location on board, connect it and put it back into service.

10.1.C.1.14 Perform all hydrostatic tests on fixed fire cylinders that are due within the next 12 months according to the list provided.

10.1.D Proof of Performance

10.1.D.1 Inspection Points

10.1.D.1.1 All work must be completed to the satisfaction of the Chief Officer. The chief officer or his representative must be present during the inspections.

10.1.D.2 Testing/Trials

10.1.D.2.1 The proper functioning of the equipment must be demonstrated to the Chief Officer.

10.1.D.3 Certification

10.1.D.3.1 The Contractor must provide the Chief Officer with two hard copies of the inspection certificates along with the original copy. The contractor will also send an electronic copy of the certificates to the IA and TA.

10.1.D.4 Documentation

10.1.D.4.1 The contractor must provide the IA, before the end of the work period, with a complete report which explains in detail the work carried out, the cause of the failures (if any), the modifications required and parts replaced.

10.1.D.4.2 The Contractor must provide the IA and the TA with an electronic copy of the report and certificates in PDF format.

10.1.D.5 Training[– Not Used]

10.2 SPRINKLER LINE REPAIR

10.2.A Identification

10.2.A.1.1 A 10-foot section of 4-inch diameter galvanized must be replaced. The pipe section is curved.

10.2.B References

10.2.B.1 Equipment Data (N/A)

10.2.B.2 Drawings

10.2.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
221-661-2_02	Arrangement sprinkler system	1
	Sprinkler photos	

10.2.B.3 Regulations and Standards

10.2.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	No
ASTM A139-16	Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)	No
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	No
ASTM A530	Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe	No

10.2.C Statement of Work

10.2.C.1.1 The Contractor must disassemble ceiling tiles and tile supports for storage and re-installation following completion of the Work. Storage may be done on the vessel. Tiles must be set in place.

10.2.C.1.2 The contractor must disassemble valves that are interference when the pipe is removed. These valves for 10" pipes are insulated with an insulating blanket that must be reinstalled when the pipes are put back in place.

10.2.C.1.3 The contractor must take insulation samples to check for asbestos. The removal and re-insulation of these pipes must be negotiated by Form 1379.

10.2.C.1.4 During the work a temporary system must be installed between the two flanges to make the system operational. The system must not be left inoperative overnight.

10.2.C.1.5 Fire system valves that are removed as interference must be replaced to keep the fire system operational during the work period.

10.2.C.1.6 The contractor must fabricate a new identical hot-dip galvanized 4"schedule 40 pipe in the appropriate shape with a female ½ npt threaded drain. And install it with couplings approved by a classification society for the pressure and diameter of the pipe.

10.2.D Proof of Performance

10.2.D.1 Inspection Points

10.2.D.1.1 The technical authority or its representative must see the temporary pipe connection system.

10.2.D.1.2 Breakpoint: Prior to galvanizing, the replaced pipe section must be tested at 80 psi for 30 minutes. The technical authority or its representative must be present. The ABS inspector should be given a minimum of 48 hours advance notice in order to give him the opportunity to assist.

10.2.D.1.3 A visual inspection of the galvanization must be done before the pipe is installed.

10.2.D.2 Testing/Trials

10.2.D.2.1 Un essai de pression du système de la section des tuyaux remplacés doit être effectué avec le chef mécanicien.

10.2.D.3 Certification

10.2.D.3.1 The connecting materials must be certified by a classification society for the use of a 4 inch diameter fire and sprinkler system.

10.2.D.4 Documentation

10.2.D.4.1 The technical data sheet for the couplings must be provided to the technical authority

10.2.D.4.2 The report of the asbestos samples must be given to the Technical Authority before any work involving the removal of the insulation begins.

10.2.D.4.3 At the end of the work, the contractor must provide a complete report detailing the work performed, the cause of the failures (if any), the necessary modifications and the replaced parts. The Contractor must also provide the Chief Engineer and maintenance officer with an electronic PDF copy of the report.

10.2.D.4.4 The Contractor must provide within 3 days of the inspection a certificate for each equipement attesting its compliance with the standard, and any inspections specified in standard CAN/CSA-B44-M90, sec. 12.

10.2.D.5 Training[– Not Used]

10.3 ASBESTOS REMOVAL OF THE PROPULSION MOTORS, SCUBA ROOM AND HEATING UNITS 1, 4 & 5

10.3.A Identification

10.3.A.1 Removing chrysotile asbestos containing insulation, from exhaust systems of the following equipment:

a) Emergency generator Room

b) Heating Unit 4 and 5.

c) SCUBA room

d) Removing chrysotile asbestos containing insulation, piping of the steam system in the propulsion motor room.

10.3.B References

10.3.B.1 Equipment Data

10.3.B.1.1 Les conduites tel que décrites

Tableau 1: conduite Amiante

Reference 141-19427-24 page 4 item 7.	Steam 5 " diamètre	9 meters long	Pastille A5
Reference 141-19427-24 Page 5 identified A14	Steam 5" diamètre	35 meters long	Pastille A13
Reference 141-19427-24 page 7 item 8	Steam 4 " diameter	6 Elbow units	Pastille A8
Reference 141-19427-24 page 8 item 9	Steam 2-3 " diameter	31 meters long	Pastille A9
Reference 141-19427-24 page 2 item 4	Exhaust 22 " diameter	8 meters	Pastille 104
Reference 221-630-4	Steam 3 " diameter	35 meters de long	N/A
Reference 420.pdf	Steam 3 " diametres	5 meters de long	N/A

10.3.B.2 Drawings

10.3.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes .

Drawing Number	DRAWING TITLE	Number of Sheets
171-09529-52	Gestion des matières dangereuses	114
141_19427_24_F1_F13	Devis désamiantage- NGCC Pierre Radisson WSP	13

141-_19427_24_information identification	Identification sommaire des calorifuges contenant de l'amiante NGCC Pierre Radisson	8

10.3.B.3 Regulations and Standards

10.3.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

Procédures MSF	Titre	Inclus – Oui/Non
Publications		
Système d'information sur les matières dangereuses utilisées au travail (SIMDUT)/Santé Canada	Fiches signalétiques (FS).	Sur demande
Normes		
Règlements		
Ministère de la Justice Canada	Loi canadienne sur la protection de l'environnement (1999) (LCPE)	
Ministère de la Justice Canada	Loi sur les normes du travail;	
Transports Canada (TC)	Loi de 1992 sur le transport des marchandises dangereuses (LTMD)	
Gouvernement du Québec	Code de sécurité pour les travaux de construction	
Gouvernement du Québec	Règlement sur la santé et la sécurité du travail.	
	Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST)	

10.3.B.4 Definition

Amended Water:	water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
Contractor:	contractor in charge of asbestos work according to the requirements of this specification.
Asbestos Containing Materials (ACMs):	materials that contain 0.1 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.

Asbestos Work Area:	area where work takes place which will, or may disturb ACMs.
Authorized Visitors:	Canadian Coast Guard, or designated representative, and representative of regulatory agencies.
Competent worker in asbestos abatement:	in relation to specific work, means a worker who:
	Is qualified because of knowledge, training and experience to perform the work;
	Is familiar with the provincial laws and with the provisions of the regulations that apply to the work;
	Has knowledge of all potential or actual danger to health or safety in the work.
Friable Materials:	material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
Glove Bag:	prefabricated glove bag as follows:
	Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
	Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
	Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
	Straps for sealing ends around pipe.
HEPA vacuum:	High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
Non-Friable Material:	material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
Occupied Area:	any area of building or work site that is outside Asbestos Work Area.
Polyethylene:	polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
Sprayer:	garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

10.3.C Statement of Work

10.3.C.1 Waste management and disposal

10.3.C.1.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

10.3.C.1.2 Collect and separate for disposal cardboard, papier plastic and polystyrene packaging material in separate on-site bins or bags to transport them off the ship for recycling in accordance with Waste Management Plan.

10.3.C.1.3 Place materials defined as hazardous or toxic in designated containers.

10.3.C.1.4 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

10.3.C.1.5 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm (6 mils) bags or leak proof drums. Label containers with appropriate warning labels.

10.3.C.1.6 Provide manifests describing and listing waste created during work. Transport containers by approved means to licenced landfill for burial.

10.3.C.2 Existing conditions

10.3.C.2.1 Reports and information pertaining to ACMS to be removed and disposed of during this Project are appended to this specification.

10.3.C.2.2 Notify Canadian Coast Guard or designated representative of friable material discovered during Work and not apparent from drawings, specifications, or reports pertaining to Work. Do not disturb such material until instructed by the technical authority. This work will be negotiated by 1379.

10.3.C.3 Scheduling

10.3.C.3.1 At least ten (10) days before beginning work pertaining to this contract, notify the following persons and authorities in writing:

i) Canadian Coast Guard.

ii) Authority having jurisdiction for ACMs disposal.

10.3.C.3.2 Submit to Canadian Coast Guard or designated representative a copy of all notices issued before beginning work.

10.3.C.4 Safety Requirements: worker protection:

10.3.C.4.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

a) Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation

requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

b) Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.

10.3.C.4.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

10.3.C.4.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

10.3.C.4.4 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing designated by Canadian Coast Guard can be used.

10.3.C.4.5 Ensure that no worker required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

10.3.C.4.6 Visitor Protection:

a) Provide protective clothing and approved respirators to Authorized Visitors to Asbestos Work Area.

b) Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

c) Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

10.3.C.5 Products

10.3.C.5.1 Materials

a) Drop and Enclosure Sheets

i) Polyethylene: 0.15 mm thick.

ii) Reinforced-polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

b) Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos containing material.

10.3.C.5.2 Waste Containers: contain waste in two separate containers

a) The inner container must be at least 0.25 mm (10 mils) thick sealable polyethylene bag.

b) Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm (6 mils) thick sealable polyethylene bag.

c) Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.

10.3.C.5.3 Glove bag

a) Acceptable products: Safe-T-Strip brand products, model appropriate for the work to be performed, or equivalent products approved by the technical authority.

b) The glove bag must be equipped with the following:

i) A tool pouch with a drain;

c) sleeves and gloves permanently sealed to the body of the bag so that the worker can access and manipulate the insulation;

i) Valves or openings allowing the introduction of a suction pipe and the nozzle of a water sprayer while maintaining the seal against the pipe, duct or other similar element;

ii) Tool holder with drain;

iii) Seamless bottom and means to seal the lower part of the bag;

iv) Removable straps if the bag has to be moved during operations.

10.3.C.5.4 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

10.3.C.5.5 Encapsulant: type 2 surface film forming, Category A water base, approved by Canadian Coast Guard or designated representative.

10.3.C.6 Execution

10.3.C.6.1 Supervision

a) Minimum of one Supervisor for every ten workers is required.

b) Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

10.3.C.7 Procedures

10.3.C.7.1 Do construction occupational health and safety in accordance with applicable requirements.

10.3.C.7.2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.

10.3.C.7.3 Pipe insulation removal using glove bag:

a) A glove bag not to be used to remove insulation from a pipe, duct or similar structure if:

i) It may not be possible to maintain a proper seal for any reason including, without limitation:

ii) The condition of the insulation;

iii) The temperature of the pipe, duct or similar structure.

b) The bag could become damaged for any reason including, without limitation:

i) The type of jacketing;

ii) The temperature of the pipe, duct or similar structure.

c) Before beginning work, the steam supply system or appliances connected to exhaust pipes must be deactivated by the Canadian Coast Guard at least 24 hours before any work on the piping of a given sector.

d) Prior to the work, the steam supply or the devices connected to the exhaust pipes must be deactivated by the Canadian Coast Guard at least 24 hours before any work on the pipes in a given sector.

e) Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted, and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be reused.

f) Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe.

g) Place hands in gloves and use necessary tools to remove insulation. Arrange insulation at the bottom of the bag.

h) Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.

i) To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in a container filled with water. Fold over into waste container and seal.

j) After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.

k) Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.

10.3.C.7.4 Work is subject to visual inspection. Contamination of surrounding areas indicated by visual inspection will require complete enclosure and clean-up of affected areas.

10.3.C.8 Cleanup

10.3.C.8.1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.

10.3.C.8.2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.

10.3.C.8.3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.

10.3.C.8.4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial and Federal authorities having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

10.3.C.8.5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

10.3.C.9 Re-insulation of pipes.

10.3.C.9.1 The contractor must re-insulate the pipes upon completion of the inspection.

10.3.C.9.2 The contractor must insulate steam lines with 1.5" of insulation.

10.3.D Proof of Performance

10.3.D.1 Inspection Points

10.3.D.1.1 The Coast Guard reserves the right to have the asbestos removal work inspected by an Industrial Hygiene Technician, at the Coast Guard's expense. This technician will request to see the preventive measures taken by the contractor to ensure compliance with the Statement of Work.

10.3.D.1.2 Regulatory Agency Requirements: Comply with local, provincial and federal government requirements for asbestos protection. In the event of any discrepancy between these requirements and those contained in this specification, the more stringent requirements must prevail. Comply with the regulations in effect at the time the work is performed.

10.3.D.1.3 A visual inspection, reference **Error! Reference source not found.** by the Technical Authority before the start of pipe re-insulation.

10.3.D.2 Testing/Trials[– Not Used]

10.3.D.3 Certification

10.3.D.4 Documentation

10.3.D.4.1 Before the start of work, the contractor must provide the Canadian Coast Guard with documents satisfactorily guaranteeing that all workers have received: adequate training concerning the risks of exposure to asbestos; personal hygiene measures:

appropriate working methods; the use of glove bags and the rules to follow for use; cleaning and disposal of breathing apparatus; protective clothing.

a) The contractor must provide documents demonstrating that the supervisory staff have completed an asbestos removal course of at least two (2) days. At least one supervisor must be appointed for each group of ten workers.

10.3.D.4.2 10.3.D.4.2 The contractor must submit to the technical authority before the end of the work period:

a) Documents satisfactorily demonstrating that appropriate arrangements have been made for the receipt and proper disposal of asbestos waste. Ensure that the landfill operator is well informed of the risks associated with the materials brought to him and that he knows the appropriate methods for their disposal.

b) Documents showing that the Contractor has liability insurance covering asbestos removal work.

c) All the follow-up slips confirming that the asbestos waste has indeed been received and properly disposed of.

d) Documents demonstrating that all workers have received adequate training and education regarding the risks associated with: exposure to asbestos; personal hygiene; the use of a breathing apparatus; the required protective clothing; the entry / exit procedures for asbestos removal areas; the techniques and protective measures to which they must comply when working in an asbestos removal area; the use, cleaning and disposal of breathing apparatus; protective clothing.

e) Material Safety Data Sheets (MSDS) for the materials and chemicals used.

f) Documents demonstrating that the operation and adjustment of the breathing apparatus given to each worker have been checked and tested.

10.3.D.5Training[– Not Used]

11.0 Hull and Related Structures

11.1 INSTALLATION OF 2 HEATERS IN HELICOPTER HANGAR

11.1.A Identificaiton

11.1.A.1.1 The contractor must remove 2 unit heaters and install 2 new ones.

11.1.B References

11.1.B.1 Equipment Data

11.1.B.1.1 2 replacement heaters are provided by the Coast Guard.

11.1.B.2 Drawings

11.1.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets

11.1.B.3 Regulations and Standards

11.1.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
Regulations		

11.1.C Statement of Work

11.1.C.1.1 The contractor must provide the labor and material to unhook the old unit heaters, disconnect them from the steam piping and electrical connections and connect the new ones.

11.1.C.1.2 The contractor must provide scaffolding to reach the heaters.

11.1.D Proof of Performance

11.1.D.1 Inspection Points

11.1.D.1.1 The work must be inspected by the ship's chief engineer or his representative.

11.1.D.2 Testing/Trials

11.1.D.2.1 A test of the unit heaters must be carried out. To prove the tightness of the connections.

11.1.D.3 Certification[– Not Used]

11.1.D.4 Documentation

11.1.D.4.1 A service report must be submitted to the IA prior to the end of the work period.

11.1.D.5 Training[– Not Used]

11.2 BATTERY ROOM REMODEL

11.2.A Identification

11.2.A.1 A new Survival Suit Storage Space must be created in the existing Battery Room, Space # 317 on the Aft Officers deck Main Deck starboard side.

11.2.A.2 The Battery Room must be relocating forward and to the port side UPS Space # 318. The existing aft port Storage Space # 320 must be converted into a passageway, allowing transverse passage from exterior open deck on the port side into the new starboard side Survival Suit Storage Space.

11.2.A.3 The spaces described above are contained longitudinally from division against engine room casing aft of frame 102 to forward division with accommodation spaces, forward of frame 106. Transversely the work area is bound by port and starboard longitudinal exterior bulkheads. The space is bound vertically by the officer's deck with mechanical & HVAC spaces below, and the navigation bridge deck with is open deck above. The deck head height inside the space is 2585mm.

11.2.A.4 To create the passageway described above, the existing longitudinal division located 1219mm to the port side of the ship centerline must have an opening cut into it and. This opening must be a simple opening allowing access to the space that stores the survival suits from the port exterior passage.

11.2.A.5 The passageway has an existing steel spray tight door on the port side. The new survival suit storage space will allow access to the lifeboat areas through a similar existing spraytight door on the starboard side.

11.2.A.6 The existing equipment in all three current spaces (317, 318 & 320) must be removed and the majority of it relocated in adjacent spaces. It must be noted that several existing items must remain in their current location; such as the existing CO2 suppression system and cylinder, existing ducting and lighting in passageway area. There are 2 existing steam heater units that must remain in their current locations.

11.2.A.7 Provide 3 storage units of different sizes to allow storage of a minimum of 92 different size survival suits. Reference: : Schéma de position et localisation composantes des composantes des locaux 317-318-320

11.2.A.8 All 3 spaces will be fully cleaned and prepared for the planned new usage.

11.2.A.9 Survival suits will also be provided by CCG. To secure these 3 storage units, three (3) welded steel foundations must be constructed and welded to the deck.

11.2.B References

11.2.B.1 Equipment Data (N/A)

11.2.B.2 Drawings

11.2.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
19077-503-A-045	Battery & Survival Suit Room Arrangement	
19077-503-S-055	Passageway Bulkhead Modification	
19077-503-A-056	Fire Zone Arrangement	
19077-503-A-057	Relocation & Foundations	
PRD-DCC 317-318-320 Proposition 2020-02-14.pdf	PRD 2020 – Plan DCC 2017-3057.vsd	

11.2.B.3 Regulations and Standards

11.2.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

Procédures MSF	Titre	Inclus – Oui/Non
Publications		
Normes		
ASHRAE 62.1-2016	Ventilation for Acceptable Indoor Air Quality	
ASME B16.11-2016	Forged Fittings, Socket-Welding and Threaded	
ASME B16.34-2017	Valves Flanged, Threaded, and Welding End	
ASME B31.3-2016	Process Piping	
ASTM A29-16	Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought	
ASTM A53-12	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc- Coated, Welded and Seamless	
ASTM A108-13	Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished ASTM A123-17 Standard Specification of Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	
ASTM A653-17	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process	
ASTM A924-17a	Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process	
ASTM C585-10	Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing	
Pipe and Tubing		
ASTM D1418-17	Standard Practice for Rubber and Rubber Lattices – Nomenclature	
CAN/ULC S102, Ed. 7	Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies	
Building Materials and Assemblies		
CSA C22.2 No. 100-14	Motors and Generators	
IEC 60034-1:2017	Rotating Electrical Machines – Part 1: Ratings and Performance	

IEC 60034-11:2017	Rotating Electrical Machines – Part 11: Thermal Protection	
MIL-PRF-22344E	Performance Specification – Insulation, Pipe, Thermal	
NEMA 250-2014	Enclosures for Electrical Equipment (1000 Volts Maximum)	
NEMA MG-1-2016	Motors and Generators	
SMACNA 006-2006	HVAC Duct Construction Standards – Metal and Flexible	
TP 11469 E (1993)	Guide to Structural Fire Protection	
UL 1004-1, Ed. 2	Rotating Electrical Machines – General Requirements	
IACS No. 47 – Part "B" –	Shipbuilding and Repair Quality Standard	

11.2.C Statement of Work

11.2.C.1 Pre-work preparations

11.2.C.1.1 The Contractor must perform a detailed survey of the existing spaces # 317, 318 & 320. If any unsafe conditions, unusual form or deterioration exists, undocumented holes in remaining bulkhead divisions or relevant damage to piping, ducting, electrical equipment, alarms or safety equipment it must be documented and brought to the attention of the vessel representative. The existing three (3) spray tight doors must be surveyed for damage. The adjacent ventilation inlet & outlet covers must also be inspected for damage.

11.2.C.1.2 Any fire detection, alarm devices, public address speakers, electrical switches and vessel safety equipment to be either removed from adjacent passageway areas or protected from physical damage and environmental contamination. Where electrical equipment and devices are to be moved or removed, lockout and tag out of the circuits supplying those devices must be performed prior moving or removing the devices.

11.2.C.1.3 It must be noted that there will be no work performed on existing wall or bulkhead insulation, ceiling insulation and existing interior liners. See drawing 19077-503-A-045 for final layout of the three (3) spaces that will be worked on.

11.2.C.1.4 The Contractor must survey adjacent spaces with vessel representative and note existing conditions. The Contractor must note locations where hot work must be done on deck and bulkheads. The existing conditions must be noted, and the adjacent spaces must be secured and sealed to prevent dust and contaminates from entry to the spaces. Any ventilation inlet and outlet area that may allow dust and fumes to spread to other areas of the ship to be properly sealed off.

11.2.C.1.5 The Contractor must be responsible for joiner panel and ceiling plank removal and insulation removal in the adjacent spaces where there is a risk of heat exposure. The Contractor must also identify if there are piping or electrical items in locations where there is a risk of hot work damage with the vessel representative. Any possible affected items must be removed or temporary protected with heat shield blankets.

11.2.C.1.6 After hot work is complete the removed or protected items to be re-inspected with the vessel representative. If damage is found, the Contractor must repair under the guidance of the vessel representative. Once all items are determined to be in proper condition the Contractor must re-install insulation, joiner panel walls and joiner ceiling systems.

11.2.C.1.7 It must be noted that existing steam heaters & piping in the port side passageway and starboard survival suit space will not be relocated or disturbed. However, the pipes may be insulated with materials that may possibly contain asbestos fibers. The two (2) heaters must have the steam supply shut down using accepted lock out and tag out procedures. The heater units themselves must be protected from mechanical damage and potential dust accumulation.

11.2.C.1.8 The Contractor must perform proper testing of the materials and perform air tests to determine if asbestos fibers are present. If asbestos fibers are found, a remediation and removal plan must be negociated with a 1379 form.

11.2.C.1.9 The Contractor must perform additional air testing to determine if the spaces are safe to work in prior to personnel being allowed to commence any work in the workspaces and adjacent passageways.

11.2.C.1.10 The Contractor must be responsible for the supply of temporary fresh air and exhaust of dirty stale air into the workspace. This supply and removal arrangement must meet all safety and environmental regulations for the tasks being performed. The Contractor must be responsible for supply of temporary lighting necessary to perform work in the space as the ship’s lighting in the area will be de-energized for modifications to the electrical wiring.

11.2.C.1.11 The Contractor must coordinate with vessel electrical and engineering crew to isolate, drain and de- energize any existing ship systems in the work area indicated. All tasks to follow vessel policies, ship yard policies and provincials guidelines for safe lock-out and tag-out procedures.

11.2.C.2 Removals and preparations

11.2.C.2.1 The Contractor must be responsible for all removals both inside the three (3) working spaces and adjacent exterior passageways. The removal scope must include disposal and storage on the vessel. The work must be coordinated with the vessel crew, to remove any specialized or specific equipment determined by the vessel Owner that may require extra care for removal and storage that will need to be re-installed before the vessel goes back in operation. The Contractor must take care with all removals to ensure these is no damage to adjacent areas. The Contractor must co-

ordinate with the vessel Owner to determine storage locations for removed and relocated equipment.

11.2.C.2.2 The Contractor must remove the following items from existing Battery Room # 317 space: Drawing Reference 19077-503-A-057 Relocation & Foundations

a) Main Battery Bank, four (4) L75x75x8 vertical angles in corners, remove in a manner for relocation into new battery room.

b) GMDSS Navigation Emergency Battery Bank, four (4) L65x65x6 angles to be removed. New frames to be made for use in new location.

c) Killark explosion proof rated light switch on the aft bulkhead at the entry to the space must be disconnected and removed for relocation to the new battery space.

d) Crouse-Hinds explosion proof rated motor control switch and Crouse-Hinds explosion proof rated motor control push button starter on the aft bulkhead at the entry to the space is to be disconnected and removed for relocation to the new battery space.

e) Two (2) explosion proof light fixtures, ceiling mounted in the space are to be removed for relocation to the new battery space.

f) The Appleton ECSK2023 explosion proof receptacle on the inboard bulkhead is to be removed for relocation to the new battery space.

g) Crouse-Hinds explosion proof rated switch mounted on the forward bulkhead and used as a GMDSS battery disconnect must be removed for relocation to the new battery space.

h) Junction box mounted on the forward bulkhead and used for temperature monitoring of the GMDSS battery must be removed for relocation on within the same space on the ceiling above the new storage racks.

i) Smoke detector L01-M018 to be removed for relocation in new battery space.

j) Two (2) lockers 457x910x1820mm must be removed and one (1) locker 535x540x1820mm must be removed. Crew to provide directions on storage or disposal.

k) Storage unit for space batteries must be removed. Crew to provide directions or storage or disposal.

l) Spare batteries must be removed and stored for relocation in the new battery room.

m) Work Bench 715x1904x950mm must be removed.

11.2.C.2.3 The Contractor must remove the following items from existing UPS # 318 space: Drawing Reference drawing 19077-503-A-057 Relocation & Foundations

a) A steel insert must be made at the end where 2 floor outlets were originally used for air conditioning units to have a continuous deck.

b) Existing General Alarm Panel must be removed and relocated to the aft side of the bulkhead, former Storage space #320.

c) Five (5) propellers and fastening attachments must be removed from bulkhead and relocated

d) The Contractor must note that UPS identified in the drawins is already removed

e) UPS Transformer Unit must be removed and relocated.
f) UPS Switch Panel must be removed and relocated.
g) Disconnect Panel for Zodiac Battery Charger must be removed and relocated.
h) Disconnect Panel for 30KVA UPS Battery Bank must be removed and relocated.
i) Light switch near door to be removed for relocation to new survival storage space.
j) Light fixture on ceiling to be removed.
k) Receptacle to be removed for relocation to new survival suit storage space.
l) Smoke detector L01-D028 to be removed for relocation to new survival suit storage space.

11.2.C.2.4 The Contractor must remove the following items from existing Storage # 320 space: Drawing Reference drawing "19077-503-A-057 Relocation & Foundations
a) Standalone Shelf Unit must be removed. Vessel crew to provide directions or storage or disposal.
b) Standalone Shelf and Closet Unit must be removed. Vessel crew to provide directions or storage or disposal.

11.2.C.3 Surface preparation

11.2.C.3.1 The Contractor must seal with the three (3) cleaned out spaces, to prevent dust from escaping the work area. The spaces must be cleaned of most loose debris and dust, during and after completion of the work.

11.2.C.3.2 After the space has been cleaned the Contractor must grit blast the floor surfaces with a low dust producing grit blast medium. The grit blasting must be done in an environmental safe manner to capture the grit blast medium and produced dust, along with preventing dust spread to other areas of the ship.

11.2.C.4 Bulkhead Steelwork

11.2.C.4.1 The Contractor must prepare the internal longitudinal bulkhead that separates the existing starboard battery room from the aft port storage room for cutting an opening on 3 sides. The opening must start from the deck surface and proceed upward. For cut-out details, see drawing reference All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes. 19077-503-S-055 – Passageway Bulkhead Modification. After the cut-out has been made and all the edges and deck surface and ground to a smooth surface a reinforcing pipe to be fitted on the 2 vertical edges and top horizontal edge.

11.2.C.4.2 The paint on this bulkhead contains lead. Grinding activities must therefore be contained so that dust can be recovered and disposed of according to federal and provincial standards.

11.2.C.4.3 The local work area must be grit blasted to the requirements in Section11.2.C.3 S. After grit blasting the local area must be prepared and painted in accordance with vessel Owner specifications and Section 11.2.C.7 Painted floor finish.

11.2.C.5 New foundations

11.2.C.5.1 The Contractor must fabricate and install any required new foundations inside new Battery Room # 318 and new Survival Suit Storage Room # 317. For foundation details see drawing reference "19077-503-A-057 Relocation & Foundations.

11.2.C.5.2 Three (3) new angle frames for supporting the survival suit storage cabinets. The frames must to be made on miter cut and welded, 4 sided, L150x75x8 angles with the long leg positioned vertically to the deck. The frames to be welded with a double sided continuous fillet weld.

11.2.C.5.3 New Spare Battery Rack 337 x 1405mm in dimension. Contractor must check with vessel crew to adjust frame size to work with required dimensions of batteries. Frame to be made with a perimeter angle frame L65x65x8 with four (4) miter cut & welded corners. The frame must be installed to the deck with four (4) vertical L65x65x8 angles welded to the deck.

11.2.C.5.4 New GMDSS & Emergency Navigation Battery double stacked Rack frame, 480mm x 560mm in plan. Contractor must check with vessel crew to adjust frame size to work with required dimensions of batteries. Frame to be made with a perimeter angle frame L65x65x8 with 4 miter cut & welded corners. The frame must be installed to the deck with four (4) vertical L65x65x8 angles welded to the deck.

11.2.C.6 Relocated Equipment and Foundations

11.2.C.6.1 The Contractor must relocate and install several existing items that were removed in Section 202. The items must be reinstalled in new locations in Battery Room # 318, Passageway Space # 320 & Survival Suit Storage Room / UPS Space # 317. For location information see drawing reference 19077-503-A-057 Relocation & Foundations. Relocations must match the existing mountings.

a) Disconnect Switch for Zodiac Battery Charger relocated to port side inside Passageway Space # 320.
b) General Alarm Panel relocated to forward bulkhead inside Passageway Space # 320
c) Propeller Storage on bulkhead for five (5) propellers on aft division inside Passageway Space # 320
d) Main Battery Bank with four (4) vertical angles, L75x75x6 welding to the deck inside new Battery Room Space # 318.
e) Disconnect Panel for 30 KVA UPS Battery Bank on starboard aft location near door inside Survival Suite Room Space # 317.
f) UPS Transformer on inside longitudinal division just port of centerline in UPS Space
g) Killark explosion proof rated light switch relocated to the entry to new battery space #318 replacing the non- explosion proof rated light switch formally in that location.

h) Crouse-Hinds explosion proof rated motor control switch and Crouse-Hinds explosion proof rated motor control push button starter relocated to location near the entry to the new battery space #318.

i) The Appleton ECSK2023 explosion proof receptacle relocated to the entry to new battery space #318, replacing the non- explosion proof rated receptacle formally in that location.

j) One (1) of the two (2) explosion proof light fixtures, relocated to the new battery space #318 in replacing the non- explosion proof rated fixture formally in that location.

k) Crouse-Hinds explosion proof rated switch mounted on the forward bulkhead and used as a GMDSS battery disconnect to be relocated to new battery space #318 near the new location of the GMDSS batteries.

l) Smoke detector L01-M018 to be relocated in new battery space #318 in replacing the non- explosion proof smoke detector formally in that location.

m) Non-explosion proof rated light switch to be relocated to the new survival suit storage space by the door to space #317 replacing the explosion proof rated light switch formally in that location.

n) Non-explosion proof rated receptacle to be relocated to the new survival suit storage space #317 at the location on the inboard bulkhead replacing the explosion proof receptacle formally in that location.

o) Smoke detector L01-D028 to be relocated to the new survival suit storage space #317 replacing the explosion proof smoke detector formally in that location.

p) Two (2) lockers 457x910x1820mm must be removed and one (1) locker 535x540x1820mm must be removed. Crew to provide directions on storage or disposal.

11.2.C.6.2 Contractor must ensure all new equipment and relocated equipment is protected from mechanical damage. Dust and moisture during the remaining scope of the work.

11.2.C.7 Painted floor finish

11.2.C.7.1 The Contractor must supply, prepare and apply a painted finish to the exposed deck areas inside the three (3) spaces. The deck painting must be done after all new and relocated foundations are welded in place to deck. The exposed deck area is approximately 24.0 square meters.

11.2.C.7.2 The finished paint systems must offer an adequate slip resistance suitable for an interior space where water and moisture will be present and must be a minimum three (3) coat system. The paint system all must also be rated for heavy duty exterior foot traffic, as recommended by International Paints.

11.2.C.7.3 The full system must be applied after all hot work is performed, with all welds inspected and repairs done. The fully paint system must be approved by the vessel Owner prior to ordering and must be provided in the bid documents. The vessel Owner must select the colour of the finish top coat.

11.2.C.7.4 The primer coat and first coat must be applied to inside the survival suit cabinet foundations. Any additional coats and finish coat must be applied to exposed visible floor surfaces. The Contractor must provide protection to the fully cured paint system for the remainder of the work. The Contractor must inspect the finish paint application with vessel Owner to check for damaged areas and make touch up repairs prior to job completion.

11.2.C.8 Paint touch ups

11.2.C.8.1 The Contractor must perform required paint touch ups on bulkheads and mountings where relocated equipment has been installed. The touch ups must be done after all hot work is done for the space in question. The paint touch ups must be done matching similar requirements as identified in Section 11.2.C.7Painted floor finish. The finish color must match the current finish color for the surface in question.

11.2.C.8.2 The Contractor must apply the top coat on the full surface of the bulkheads.

11.2.C.9 Common Systems

11.2.C.9.1 CO2 Nozzle relocation and piping

a) The Contractor must remove the existing CO2 application nozzle that is located in Space # 318 over the UPS Unit in its existing location. The Contractor must survey the supply piping and controls to ensure the system is not active and the supply of CO2 isolated along with proper lock out and tag out at the source.

b) The Contractor must survey the existing piping and plan an extension of the pipe routing the inboard adjacent space. The existing CO2 nozzle must be relocated over the top of the UPS in its planned new location. The Contractor must supply and install piping to relocate the nozzle as shown in drawing reference 19077-503-A-045 Battery & Survival Suit Room Arrangement and 19077-503-A-057 Relocation & Foundations.

c) The Contractor must also install a site placed penetration in the longitudinal division between the new battery room & UPS Space. The penetration must meet Flag & Class requirements and must be considered as fire proof and gas tight in design. Contractor must provide the vessel Owner with detail of penetration for approval prior to starting any work.

d) The Contractor must perform a full visual inspection and full nondestructive examination on all piping welds associated with the CO2 pipe re-routing and complete any required pressure testing. All inspections must be done in accordance to CAN/CSA and CWB rules and requirements along with vessel Owner, Class & Flag requirements. The inspected pipe system must be cleaned of debris with a charge of compressed air.

11.2.C.10 Steam Heaters Re-activation

11.2.C.10.1 The Contractor must perform a detailed inspection of the two (2) steam heaters along with a full cleaning to ensure there is no small debris and dust present in the

heater units. The steam heater system must be re-activated and tested to vessel supplied performance requirements.

11.2.C.11 Battery Room Exhaust

11.2.C.11.1 The new battery room must be fitted with a new exhaust ventilation system. The system must consist of a new explosion proof exhaust fan and required ducting. The Contractor must install an inlet duct from just over the relocated main battery bank to the site located fan; the outlet duct must run for the exhaust fan to the existing ventilation opening close to the door.

11.2.C.12 Electrical Power and Lighting Modifications

11.2.C.12.1 Before the removal of any electrical equipment has started all circuits should have been properly de- energized and isolated as discussed in section 201. The cables that have been disconnected from various removed devices should be tagged when disconnected.

11.2.C.13 Zodiac Battery Disconnect

11.2.C.13.1 The zodiac battery disconnect which has been relocated to Space #320 must have the incoming power cable re-routed through space #318 and a passed through a new sealed penetration in the bulkhead separating space #318 to #320. The cable should not be required to be spliced in order to reach the new location of the zodiac charger on the forward bulkhead of space #320.

11.2.C.14 General Alarm Panel

11.2.C.14.1 The general alarm panel is to be moved from space #318 to space #318 on the opposite side of the same bulkhead where it is currently installed. All cables are to be disconnected and tagged with the terminals to which they belong. A new fire rated penetration is to be installed in the bulkhead near the lower edge of where the general alarm panel was installed. The new location for the general alarm panel should slightly higher on the opposite side of the bulkhead to ensure sufficient cable lengths. Cables are to be passed through the new fire rated penetration and re-installed and terminated in the General Alarm Panel.

11.2.C.15 Main Battery Bank and Diconnect Panel

11.2.C.15.1 The main 30 kVA disconnect panel previously installed on the forward bulkhead of room #318, had cables EB-415-C serving as input. These cables are routed from a location through the floor near the door to space #317, up across the ceiling through space #317, through a penetration in the inboard bulkhead and continue through space #318 to the disconnect switch on the forward bulkhead of that space. These cables will be re-used for both the relocation of the disconnect switch and main batteries. The cables should be cut approximately half way up the bulkhead in space #317. The incoming cable ends, coming from below should be terminated as the input to the disconnect switch in its new location near the door to space #317. The remaining length of cables EB-415-C which route through the space to the former

location of the disconnect switch in space #318 must remain in place and be used as the power feed from the disconnect switch in its new location to the main batteries. The cut end of the cables which extend to space #318 must be connected as output to the disconnect switch. The far end of cables EB-415-C formally connected to the disconnect switch in space #318 must be re-routed locally in that space to connect as input to the main batteries.

11.2.C.16 UPS System, Transformer and UPS Switch

11.2.C.16.1 The incoming power cable EB 415 to the UPS system comes from space #317 and passes through a penetration in the inboard bulkhead to space #318 where it connects to the transformer. The transformer must be relocated to the opposite side of the bulkhead and cable EB 415 feeding it should be pulled back through the penetration and re-terminated to the transformer in its new location in space #317. The outgoing cable from the UPS switch UPS 3-1 is routed back through the bulkhead to space #317. This cable should also be pulled back though its penetration in the bulkhead and re- terminated to the UPS switch in its new location in room #317. Cables EP 415-2 and EP415-3 between the UPS system and the UPS switch must be re-terminated between the UPS switch and UPS system in their new locations in room #317. Cable EP 415-1 between the transformer and the UPS switch must be re-terminated in the transformer and UPS switch in their new locations within space #317. All cables are to be re-used and no cables should need to be extended in length. Penetrations through the inboard bulkhead no longer used must be sealed.

11.2.C.17 Lighting and Receptacles

11.2.C.17.1 For the 2 explosion proof rated light fixtures and receptacle removed from the former battery space #317 and relocated to the new battery space #318, these devices should be electrically connected into the existing circuits in place of the removed non-explosion rated devices in the new battery space #318. Similarly, the non-explosion proof rated receptacle from the former UPS room #318 must be electrically connected into the existing circuit in the new survival suit space #317 in place of the removed explosion proof rated device. The non-explosion proof lighting fixture removed from the former UPS space #318 is not suitable to be used in the new survival suit space #317 as it is just a single bulb. Instead a new marine rated fluorescent fixture with 3 T8 bulbs, like a Glamox GKI U or similar must be procured and installed in the existing circuit where the one explosion proof fixture was removed. The 3 light fixtures in the new survival storage space #317 must be adjusted on site as required to provide sufficient lighting for the area after the survival suit storage suit racks have been installed.

11.2.C.18 Smoke Detectors

11.2.C.18.1 For the explosion proof rated smoke detector removed from the former battery space #317 and relocated to the new battery space #318, it should be electrically connected into the existing circuit in place of the removed non-explosion rated devices in the new battery space #318. Similarly, the non- explosion proof rated smoke detector from the former UPS room #318 must be electrically connected into

the existing circuit in the new survival suit space #317 in place of the removed explosion proof rated device.

11.2.C.19 Exhaust Fans

11.2.C.19.1 A new explosion proof fan for the new battery space #318 must be installed. The existing Crouse-Hinds explosion proof rated motor control switch and Crouse-Hinds explosion proof rated motor control push button starter must be relocated to location near the entry to the new battery space #318 for controlling this fan. The power source is to be determined. The Contractor must consult with the chief engineer on the desired source for this power feed. The Contractor must install and terminate cables from the power source to the motor control switch and from the switch to the fan. Cable must be supported using existing cable trays must be used where possible. A new non-explosion proof rated motor control switch must be procured and installed in space #317 replacing where the explosion proof switch was removed. The switch must be electrically connected using the existing wiring to the fan in that space.

11.2.D Proof of Performance

11.2.D.1 Inspection Points

11.2.D.1.1 All work must be inspected by the IA or delegate.

11.2.D.1.2 A visual inspection of the welds around door reinforcement work. A magnetic particule inspection for the insert blocking the old AC through pipe.

11.2.D.1.3 The Contractor must perform a fonctional test of equipment in presence of the chief engineer.

11.2.D.2 **Testing/Trials[– Not Used]**

11.2.D.3 Certification[– Not Used]

11.2.D.4 **Documentation**

11.2.D.4.1 The contractor must provide a complete document of the findings, reports and results. The documentation must be provided to the technical authority before the end of the work period.

11.2.D.4.2 Report for non destructive testing of the welds

11.2.D.5 **Training[– Not Used]**

11.3 LAUNDRY ROOM DRYER VENT

11.3.A Identification

11.3.A.1 A laundry room has been fitted out on the main deck and finishing is required for the ventilation of the dryer

11.3.B References

11.3.B.1 Equipment Data

11.3.B.1.1 The laundry room is on the main deck on the starboard side.

11.3.B.2 **Drawings**

Drawing Number	Drawing Title	Number of Sheets
221-H101_3	Arrangement généraux – Pont supérieur, pont principal Rev I	

11.3.B.3 **Regulations and Standards**

11.3.B.3.1 The following regulations and standards apply to the work performed in this section; the contractor must ensure that all work performed in this section meets regulations and standards, as well as federal and territorial regulations and standards.

Procédures du Manuel de sûreté et de sécurité de la flotte (MSF)	Title	Included – Yes/No
Publications		
Standards		
Regulation		
	Loi de la marine marchande du Canada et ses règlements	

11.3.C Statement of Work

11.3.C.1 Dryer ventilation

11.3.C.1.1 The contractor must fabricate a rigid dryer outlet vent to connect to the existing natural vent. The manufactured rigid vent pipe must have a door to allow for cleaning of the pipe.

11.3.D Proof of Performance

11.3.D.1 **Inspection**

11.3.D.1.1 The Contractor must inspect the dryer outlet for leaks in the presence of the chief mechanic or his representative.

11.3.D.2 **Testing/Trials**

11.3.D.2.1 The Contractor must functional test of the equipment.

11.3.D.3 **Certification (N/A)**

11.3.D.4 **Documentation (N/A)**

11.3.D.5 Training (N/A)

11.4 ENGINE ROOM RATING'S WASHROOM

11.4.A Scope

11.4.A.1 The engine room rating's washroom must be rearranged to allow for a larger shower and better use of space.

11.4.B References

11.4.B.1 Equipment Data

11.4.B.1.1 The engine room rating's washroom is on the main deck in room #651.

11.4.B.1.2 Equipment provided by the Canadian Coast Guard

a) A washer-dryer unit is provided by the coast guard.

b) A hand washing basin is provided by the coast guard.

c) Shower mixing valve

11.4.B.2 Drawings

11.4.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
221-H-80_1	Insulation Plan at superstructure Decks Rev D	1
221-H-80_2	Insulation Plan at Upper Deck & Main Deck & 17.0' flat. Rev D	1
DCC 2019-3427	Proposition W.C. #651 Assistants mécaniciens rev 1	1

11.4.B.3 Regulations and Standards

11.4.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
	NSF61 potable water	
Regulations		

11.4.C Statement of Work

11.4.C.1 Dismantling

11.4.C.1.1 The contractor must empty the bathroom elements in order to make the modifications.

11.4.C.1.2 The Contractor must arrange ventilation to an outside deck for dust and smells to exhaust the work zone.

11.4.C.1.3 For re-installation, if the contractor sees any deficiencies with the equipment before removal, he must notify the technical authority.

a) The toilet and its mechanisms will be reused.

b) The contractor must remove the suspended ceiling and suspension system.

11.4.C.1.4 To dispose of

a) The washer and dryer must be set up by the contractor.

b) Toilet and shower partitions. Sinks.

c) Floor tiles.

11.4.C.2 Floor covering

11.4.C.2.1 The contractor must remove the tiles covering from the floor.

11.4.C.2.2 The contractor must include marine cement repairs following tile removal. The contractor must install an epoxy type coating with coloured flakes throughout the room including a 4-inch border on the walls. The siding must be continuous under the sink cabinet and under the washer-dryer unit.

11.4.C.2.3 Option: Contractor must destroy and dispose of marine cement preparing the surface and redo the approved marine cement system for the entire bathroom surface. The thickness is 4 inches 110” x 116”.

11.4.C.3 Wall cladding

11.4.C.3.1 The contractor must remove the desk panels that are in place to join the steel partitions. The inspection authority or its representative must be given an opportunity to see the steel partition before it is covered.

11.4.C.3.2 The Contractor must supply and install wall panels for the entire room. The wall panels used must be approved by a classification society. The panels must be designed for high moisture content areas.

11.4.C.4 Piping

11.4.C.4.1 A new deck penetration must be made to allow for a washer drain. The contractor must connect this drain in the engine room to a grey water drain. The connection must allow the drain to be opened for cleaning. The piping must be hot-dip galvanized steel. Threaded piping with an accessible connection is acceptable.

11.4.C.4.2 The grey water piping is accessible from the engine room. Insulation with aluminum cladding is on the ceiling and must be reinstalled once the piping is installed.

11.4.C.5 Hand wash sink

11.4.C.5.1 The contractor must coordinate with the contractor providing the hand washing sink unit. The sink and installation is provided by the Coast Guard.

11.4.C.5.2 The contractor must bring the piping to the wall of the sink at **the height behind the cabinet.**

11.4.C.5.3 The contractor must supply and install a automatic faucet. Connect water inlet and outlet plumbing.

11.4.C.6 Shower cubicle

11.4.C.6.1 The contractor must supply and install a 42"x42" shower enclosure with stainless steel cladding on the walls up to the height of the suspended ceiling.The contractor must do the installation and reinforcement at the back of the retaining bar that must be installed in the shower.

11.4.C.6.2 The contractor must supply and install the faucet. The shower must have a thermostatic valve.

11.4.C.6.3 The piping must come from the ceiling and not be under the wall of the shower. Protection must surround the pipes.

11.4.C.6.4 The dry shower enclosure must have a full-height door. A retractable bench, 300 lbs capacity, must be installed.

11.4.C.6.5 All connections to the ship's drinking water must be made with silver solder. All materials used must be shown to the Chief Engineer and NSF 61 Material Safety Data Sheets and approvals must be submitted to the Technical Authority before the solder takes place.

11.4.C.7 Lavatory

11.4.C.7.1 The contractor must supply and install toilet stall partitions. The style must be with a stainless steel finish and with a height that optimizes the

11.4.C.8 Electricity

11.4.C.8.1 The electric hand dryer must be relocated near the new sink for hand washing.

11.4.C.8.2 The existing wall-mounted heating unit must be removed.

11.4.C.8.3 The contractor must move the electrical connections for the washer and dryer to bring them to be able to plug in the unit. The contractor must report to the technical authority or its representative if electrical problems are present. These will be negotiated by Form 1379.

11.4.C.8.4 The contractor must supply and install a heating unit on the ceiling of the room. In the centre. The contractor must connect the unit and adapt the ceiling tiles for this change.

11.4.D Proof of Performance

11.4.D.1 Inspection Points

All work must be inspected by the IA or delegate.

11.4.D.2 Testing/Trials

11.4.D.2.1 A magnetic particle test and visual inspection must be carried out for deck penetration between the washroom and engine room.

11.4.D.3 Certification

11.4.D.3.1 All products used for potable water supply must be certified to NSF 61.

11.4.D.3.2 All products used for floor covering must be approved by a classification society.

11.4.D.3.3 The non destructive technician must be certified level 2.

11.4.D.4 Documentation

11.4.D.4.1 Data sheets for certified products must be submitted to the Technical Authority prior to commencement of use on board..

11.4.D.4.2 The Contractor must provide within 3 days of the inspection a certificate for each equipement attesting its compliance with the standard, and any inspections specified in standard CAN/CSA-B44-M90, sec. 12.

11.4.D.4.3 The Contractor must provide the IA and the TA with an electronic copy of the report in PDF format.

11.4.D.5 Training[– Not Used]

11.4.D.5.1 [– Not Used]

11.5 DECKHAND'S WASHROOM

11.5.A Scope

11.5.A.1.1 Deckhands' washrooms must be refreshed to allow for the replacement of floor coverings and shower stalls.

11.5.B References

11.5.B.1 Equipment Data

11.5.B.1.1 The washroom is on the main deck in Room #604

11.5.B.2 Drawings

11.5.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
221-H-80_1	Insulation Plan at superstructure Decks Rev D	1
221-H-80_2	Insulation Plan at Upper Deck & Main Deck & 17.0' flat. Rev D	1
Space 604.pdf	Space 604	1

11.5.B.3 Regulations and Standards

11.5.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
	NSF61 potable water	
Regulations		

11.5.C Statement of Work

11.5.C.1 Dismantling

11.5.C.1.1 The contractor must empty the bathroom elements in order to make the modifications. Forced ventilation to the outside must be present to evacuate dust and smells outside.

11.5.C.1.2 For re-installation by the Contractor, if the contractor sees any deficiencies with the equipment before removal, he must notify the technical authority.

a) The toilet and its mechanisms will be reused.
b) The contractor must remove the suspended ceiling and suspension system.
c) Electric hand dryer

11.5.C.1.3 To dispose of

a) The washer and dryer must be removed from the location.
b) Toilet and shower partitions. Sinks.
c) Floor tiles.

11.5.C.2 Floor covering

11.5.C.2.1 The contractor must remove the tile covering and dispose of it.

11.5.C.2.2 The contractor must include marine cement repairs following tile removal. The contractor must install an epoxy type finish with colored flake in the entire room including a 4-inch border on the walls. The flooring must be continuous under the sink cabinet and under the washer-dryer unit.

11.5.C.2.3 The Contractor must include a spacer to bring the floor drains up to floor level. An incline must be created for the water to flow toward drains.

11.5.C.2.4 Option: Contractor must destroy and dispose of marine cement preparing the surface and redo the approved marine cement system for the entire bathroom surface. The thickness is 4 inches 115 ‘’ x 115’’.

11.5.C.3 Toilet Stall partition

11.5.C.3.1 Partitions must have a brushed stainless steel finish.

11.5.C.3.2 Doors in partitions must be full height.

11.5.C.3.3 Locking and hinge mechanisms must match.

11.5.C.4 Wall panneling

11.5.C.4.1 The contractor must remove the desk panels that are in place to join the steel partitions. The inspection authority or its representative must be given an opportunity to see the steel partition before it is covered.

11.5.C.4.2 An inspection of the steel must be done by the contractor and the chief engineer.

11.5.C.4.3 The contractor must supply and install wet room wall panels. For the entire bathroom. The chosen pannels must be approved by a classification society and must be designed for a bathroom with the transition to the higher deck.

11.5.C.5 Opening to Air Conditioning compartment 4

11.5.C.5.1 The Contractor must create a resealable opening between the deckhand washroom and the air conditioning compartment 4.

11.5.C.5.2 The size must allow for cleaning of the refrigeration unit condenser.

11.5.C.5.3 The contractor must provide as-built drawings of this removable panel.

11.5.C.6 Piping

11.5.C.6.1 Piping from ceiling collectors must be replaced with copper piping. All joints must be made using an NSF 61 approved process.

11.5.C.7 Hand wash sink

11.5.C.7.1 The contractor must coordinate with the contractor providing the hand washing sink unit. The sink and installation is provided by the Coast Guard.

11.5.C.7.2 The contractor must bring the piping to the wall of the sink at the height behind the cabinet.

11.5.C.7.3 The contractor must supply and install a faucet. Connect water inlet and outlet plumbing.

11.5.C.8 Shower cubicle

11.5.C.8.1 The Contractor must supply and install 2 stainless steel shower enclosures 36" x 36". The shower surround must go higher than the ceiling.

11.5.C.8.2 The contractor must do the installation and reinforcement at the back of the retaining bar that must be installed in the shower.

11.5.C.9 washer-dryer unit

11.5.C.9.1 A washer-dryer unit will be provided by the Canadian Coast Guard. It must be installed by the contractor. Including a base and a retaining mechanism. The unit will be in the same location as the old one. The contractor must make the electrical, water supply, drain and ventilation dryer connections.

11.5.D Proof of Performance

11.5.D.1 Inspection Points

All work must be inspected by the IA or delegate.

11.5.D.2 Testing/Trials

11.5.D.2.1 Bathroom systems must be turned on in the presence of the contractor.

11.5.D.3 Certification

11.5.D.3.1 All products used for potable water supply must be certified to NSF 61.

11.5.D.3.2 All products used for floor covering must be approved by a classification society.

11.5.D.4 Documentation

11.5.D.4.1 At the end of the work, the contractor must provide a complete report detailing the work performed.

11.5.D.4.2 Certificat for all the certified material used.

11.5.D.5 Training[– Not Used]

11.5.D.5.1 [– Not Used]

11.6 SHOWER SURROUND WOMEN WASHROOM

11.6.A Identification

11.6.A.1 The shower surround and shower floor in the women's washroom must be renewed.

11.6.B References

11.6.B.1 Equipment Data

11.6.B.1.1 The women's bathroom is on the main deck.

11.6.B.2 Drawings

11.6.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets

11.6.B.3 Regulations and Standards

11.6.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
Regulations		

11.6.C Statement of Work

11.6.C.1 Shower bottom

11.6.C.1.1 The bottom of the 36" X 36" shower must be redone with an approved marine epoxy. The finishing coat must be with flake color.

11.6.C.1.2 Option: Contractor must destroy and dispose of marine cement preparing the surface and redo the approved marine cement system for the entire shower surface. The thickness is 4 inches 36" X 36".

11.6.C.1.3 The slope of the drain must be taken into consideration so that water does not accumulate.

11.6.C.1.4 The epoxy must rise on the walls to a height of at least 4 inches.

11.6.C.2 Shower liner

11.6.C.2.1 The shower surround must be constructed of continuous white material for full height. It must extend beyond the suspended ceiling.

11.6.C.2.2 The same accessories that were in the shower must be reinstalled. Soap dish, grab bar and faucet.

11.6.D Proof of Performance

11.6.D.1 Inspection Points

11.6.D.1.1 Welds must be inspected by the inspection authority or its representative prior to coating.

11.6.D.2 Testing/Trials

11.6.D.3 Certification

11.6.D.3.1 All materials used for water supply plumbing must be NSF 61 approved.

11.6.D.3.2 All materials used for floor covering must have marine approval.

11.6.D.4 Documentation

11.6.D.4.1 The contractor must provide a detailed report explaining the work performed.

11.6.D.4.2 Certificates or data sheets for certified materials.

11.6.D.5 Training[– Not Used]

11.7 FLIGHT DECK DRAIN

11.7.A Identification

11.7.A.1 Modify flight deck drains to direct water directly overboard through the bulwark.

11.7.B References

11.7.B.1 Equipment Data

11.7.B.1.1 A total of 14 drains with a diameter of 3" and 4 ½" inches between the flight deck and the upper deck.

11.7.B.2 Drawings

11.7.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
	Référence drain d'envol.pdf	

11.7.B.3 Regulations and Standards

11.7.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
Regulations		

11.7.C Statement of Work

11.7.C.1.1 The contractor must extend the 14 drains of the flight deck to direct them directly overboard through the bulwark. Reference flight deck drain.pdf

11.7.C.1.2 The new section must be welded to the pipe and the bulwark.

11.7.C.1.3 All the new steel must be painted inside and out.

11.7.D Proof of Performance

11.7.D.1 Inspection Points

11.7.D.1.1 Welds must be inspected by the inspection authority or its representative prior to coating.

11.7.D.2 Testing/Trials[– Not Used]

11.7.D.3 Certification[– Not Used]

11.7.D.4 Documentation

11.7.D.4.1 A service report must be submitted to the IA prior to the end of the work period.

11.7.D.5 Training[– Not Used]

11.8 MAST REINFORCEMENT

11.8.A Identification

11.8.A.1 The front mast must be reinforced to support the weight of a new antenna to be installed in the future.

11.8.B References

11.8.B.1 Equipment Data

11.8.B.1.1 The work will be performed on the navigation deck just behind the wheelhouse.

11.8.B.2 Drawings

11.8.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
NT-2757-19-DE502A-(APP-INFO)	Remplacement antenne renforts sous le mât avant	

11.8.B.3 Regulations and Standards

11.8.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
CT-043-EQ-EG-001-E	Spécifications de soudage	
Regulations		

11.8.C Statement of Work

11.8.C.1 Dismantling

11.8.C.1.1 The Contractor must remove the ceiling, tiles and suspension on the navigation deck and preserve it for reinstallation after completion of the work.

11.8.C.1.2 The Contractor must remove and dispose of the corridor ceiling insulation. To each partition and not just at the work site.

11.8.C.1.3 The Contractor must remove the wall partitions from the navigation deck.

11.8.C.1.4 The Contractor must protect electrical wires running perpendicular to the work. The engineering drawing must include photos of the cable trays.

11.8.C.2 Reinforcement according to engineering plan.

11.8.C.2.1 The contractor must install steel reinforcement plates under the beams in the ceiling of the navigation deck.

11.8.C.2.2 The contractor must install the steel plates through 2 bulkheads. As shown on plan NT-2757-19-DE502A-(APP-INFO).

11.8.C.2.3 Contractor must paint all new steel prior to insulation. The contractor must provide a paint system that can be used in interior rooms

11.8.C.3 Insulation

11.8.C.3.1 The Contractor must insulate the entire ceiling of the navigation deck corridors.

a) The contractor must prepare and repaint an approximate 2 square meters non-continuous area (where required) to be cleaned and painted with 2 coats of a marine paint system for interior use. The Chief Engineer must be given the opportunity to view the paint before the contractor re-insulates.
b) The insulation must be marine approved rock wool.
c) Total thickness must be 4 inches.
d) A vapour barrier must be installed throughout and each joint must be sealed.

11.8.C.4 Wall Panels

11.8.C.4.1

11.8.D Proof of Performance

11.8.D.1 Inspection Points

11.8.D.1.1 Welds must be inspected by the inspection authority or its representative prior to coating.

11.8.D.2 Testing/Trials

11.8.D.2.1 All welds must be non-destructively tested. One 100% visual test and one magnetic particle test.

11.8.D.3 Certification

11.8.D.3.1 The material used for insulation must be approved for marine use.

11.8.D.3.2 The steel used must be certified by a classification society.

11.8.D.3.3 The non-destructive testing technician must be certified level 2.

11.8.D.4 Documentation

11.8.D.5 The contractor must provide a detailed report explaining the work performed.

11.8.D.6 The non-destructive testing report must be submitted to the Technical Authority prior to the end of the work period.

Training[– Not Used]

11.9 INSTALLATION OF 3 INSIDE DOORS

11.9.A Identification

11.9.A.1 Two new type A-0 doors must be installed at the main deck for the laundry room at the main deck for the deckhand shop and one A-60 door must be installed for the incinerator room.

11.9.B References

11.9.B.1 Equipment Data

Localisation	Door number	Dimensions
A0		
Atelier des matelots pont principal du côté bâbord	Porte 114	L 760 mm x H 1860 31'' x 73 ¼''
La buanderie est au pont principal du coté tribord du navire	Porte 120	L 760 mm x H 1860 31'' x 73 ¼''
A60		
La salle de l'incinérateur porte vers le corridor	Porte 176	L 787.7 mm x H 1842 31'' x 72 1/2''

11.9.B.1.1 Les portes existantes sont des portes d'acier avec cadres soudés.

11.9.B.2 Drawings

11.9.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
222-H-101	Arrangement général	3
74-1004_03	Firedoor class « A-60 » with (3) point latch bolt	
221-H-78_02	Door Schedule at upper & main dks @ 17'-0'	
	Local 600 porte Door.pdf	1

11.9.B.3 Regulations and Standards

11.9.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
TP14612	Procedures for approval of life-saving appliances and fire safety systems, equipment and products –	
Standards		
CT-043-EQ-EG-001-E	Spécifications de soudage	
Regulations		

11.9.C Statement of Work

11.9.C.1 Dismantling

11.9.C.1.1 The contractor must remove the cable to pull the CO2 for the duration of the steel work. Two CO2 cable lines run through the door frame. These CO2 devices must be reset at the end of the work.

11.9.C.1.2 In the deckhand workshop, two electrical outlets are also located near the door frame of the deckhouse. Photo, Local 600 Door porte.pdf, attached showing the passage of the CO2 device and electrical connections.

11.9.C.1.3 The paint on the bulkheads contains lead.

11.9.C.1.4 Finishes; Contractor must remove ceiling tiles and tile tracks that are necessary to clear the work space. Tiles and hangers must be stored for re-installation.

11.9.C.1.5 Doors present shall be welded in place. The contractor must remove and dispose of them.

11.9.C.2 Equipment

11.9.C.2.1 The Contractor must provide three fire doors for the vessel. Two A0 doors of nominal dimension of 31"x 73 ¼ " high and one A60 door dimension of 31" x 72 1/2".

a) With lock and 2 keys per door

b) With a gasket to be gas tight. For local use CO2 protected.

11.9.C.2.2 The contractor must pay particular attention to the certification of doors. Canadian certification must be noted on the door's certificate and not class only or IMO and USCG approval.

11.9.C.2.3 The new door provided by the contractor must open in the same direction as the existing door. Deckhand Shop: i.e. the door has hinges on the left side when opening towards the user. The door opens towards the inside of the room. Laundry Room: The door opens towards the inside of the room with the hinges on the right when you enter.

11.9.C.2.4 The contractor must install a magnetic restraint system.

11.9.C.2.5 The door must have a key locking mechanism. Keys must be turned in to the Technical Authority before the end of the work period.

11.9.C.2.6 The door must be factory painted.

11.9.C.3 Magnetic Retention

11.9.C.3.1 Deckhand Shop Door

11.9.C.3.2 The Contractor must interface the magnetic restraint system with the rest of the vessel's system. Currently the doors do not have a magnetic restraint system and no wire is run to the door position.

11.9.C.4 Painting

11.9.C.4.1 The Contractor must touch up paint in areas that have been disturbed during the work.

11.9.D Proof of Performance

11.9.D.1 Inspection Points

11.9.D.1.1 The chief engineer must agree to the installation of the gasket with a light directed towards the door. This light must not be visible from the other side.

11.9.D.1.2 Door slack must be measured and recorded. Door slack must be within the manufacturer's acceptable limits.

11.9.D.1.3 The closing system must be demonstrated to the Chief Engineer. The closing mechanism must engage to secure the door during closing.

11.9.D.1.4 The remote door locking system must be demonstrated to the chief engineer.

11.9.D.1.5 The weld must be seen before painting.

11.9.D.1.6 All work must be inspected by the IA.

11.9.D.2 Testing/Trials

11.9.D.2.1 All welds must be non-destructively tested. One 100% visual test by a level 2 technician.

11.9.D.3 Certification

11.9.D.3.1 The doors must be certified by a classification society A0 and A60 with a Canadian approbation.

11.9.D.3.2 The non-destructive testing technician must be certified level 2.

11.9.D.4 Documentation

11.9.D.4.1 The contractor must provide a detailed report explaining the work performed.

11.9.D.4.2 Door certificates must be delivered to the Technical Authority before the end of the work period.

11.9.D.4.3 The Contractor must provide documentation for the doors.

11.9.D.4.4 The contractor must provide the door frame weld inspection certificate.

11.9.D.5 Training[– Not Used]

11.10 CHIEF ENGINEER NIGHT CABIN

11.10.A Identification

11.10.A.1.1 The bedroom in the chief engineer's has a condensation problem due to inadequate insulation. The exterior bulkheads and deck insulation must be re-insulated.

11.10.B References

11.10.B.1 Equipment Data

11.10.B.1.1 The chief engineer's room is on the boat deck in room 401.

11.10.B.1.2 The floor of the room is 2" thick of marine cement. The floor covering is a carpet.

11.10.B.1.3 The insulation used in the room is 2" thick fiberglass with a vapour barrier.

11.10.B.2 Drawings

11.10.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
221-h-80_01	Insulation plan at superstructure Rev D	1
221-h-82		
	Photos chamber mécanicien	

11.10.B.3 Regulations and Standards

11.10.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these

Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
TP14612	Procedures for approval of life-saving appliances and fire safety systems, equipment and products –	
Standards		
CT-043-EQ-EG-001-E	Spécifications de soudage	
Regulations		

11.10.C Statement of Work

11.10.C.1 Dismantling

11.10.C.1.1 The Contractor must move the furniture from the Chief Engineer's room and store it in order to be able to reinstall it.

11.10.C.1.2 The Contractor must remove ceilings to be able to retain them. The contractor must reinstall them when the work is completed.

11.10.C.1.3 The contractor must remove wall panels for reuse.

11.10.C.1.4 1The contractor must remove and dispose of the insulation on the exterior partitions and ceiling of the chief engineer's room. The material shall be 1" thick fibreglass. Reference drawing 221-H-80_01

11.10.C.1.5 The contractor must remove insulation below the chief engineer's room in lieu of the upper deck passage. To gain access to this area the contractor must remove stainless steel plates. The plates must be retained and replaced at the completion of the insulation work.

11.10.C.1.6 The contractor must remove and dispose of carpet in the chief engineer's room.

11.10.C.1.7 The contractor must remove and store electrical components in the room that are installed above ground and reinstall them.

11.10.C.1.8 Electrical components that pass through the partitions shall be removed and stored by the contractor.

11.10.C.2 Painting

11.10.C.2.1 The contractor must mechanically prepare the surfaces that were under the insulation. Partitions and ceiling for a distance of 2 feet from the partitions. As shown in drawing 221-h-80.

11.10.C.2.2 The contractor must touch up paint on areas that have been mechanically prepared. For the tender, the contractor must calculate that the bottom 2 feet of the partition must be completely cleaned with the first 1 foot of the bottom severely corroded. A discontinuous 5 % percentage of the remaining 2 feet of surface including the ceiling must be prepared and repainted.

11.10.C.2.3 The contractor must touch up the paint once the insulation nails have been installed.

11.10.C.2.4 Touch-ups must include one coat of primer and two coats of marine paint from an approved system for living areas.

11.10.C.3 Insulation

11.10.C.3.1 The contractor must install marine thermal insulation approved by a recognized classification society. The insulation must be installed on the exterior walls of the chief's bedroom; this includes the bathroom section. The total thickness must be 4 inches, including members. The insulation must be covered with a membrane with 0% permeability approved by a recognized classification society: Venture Clad or equivalent.

11.10.C.3.2 The insulation area is defined in drawing 221-h-80.

11.10.C.4 Thickness Tests Steel

11.10.C.4.1 The Contractor must test the thickness of the steel of the exterior bulkheads and deck. Thickness testing must be done from the deck to a height of 2 feet. The contractor must quote a price for a batch of 100 thickness measurements. The measurements must be taken by a NRCAN level 2 or 3 technician.

11.10.C.4.2 The contractor must take measurements of the steel thickness of the cabin deck through the upper deck gangway; 100 measurements must be taken.

11.10.C.5 Floor covering

11.10.C.5.1 The contractor must repair the sub-floor. The surface area is evaluated at 15% once the carpet is removed.

11.10.C.5.2 The contractor must install a carpet approved by a marine classification society. The installation is wall-to-wall in the bedroom. The carpet must have two shades of blue. The contractor must confirm the pattern with the chief engineer.

11.10.C.5.3 The carpet must rise 6 inches up the walls and have a room to protect the transition to the wall. The edges must be sealed.

11.10.C.6 Wall Panels

11.10.C.6.1 The panels of the entire cabin must be covered with a marine wallpaper approved for use on a Canadian vessel. The panels must be covered independently of the panel joints.

11.10.C.6.2 The contractor must reinstall all accessories that were on the bulkheads.

11.10.C.6.3 The pattern of the wallpaper must harmonize with the pattern of the chief engineer's office.

11.10.D Proof of Performance

11.10.D.1 Inspection Points

11.10.D.1.1 The Contractor must make an inspection in the presence of the Technical Authority to obtain agreement on the condition of the furniture before dismantling work begins.

11.10.D.1.2 The Technical Authority or his delegate must see :

a) Steel partitions prior to mechanical preparation.
b) After mechanical preparation prior to painting.
c) Painting prior to insulation installation.
d) Installation of insulation in accordance with the manufacturer's recommendations.
e) The installation of the membrane and joints in accordance with the manufacturer's recommendations.

11.10.D.1.3 Room temperature during the application of floor coverings.

11.10.D.2 Testing/Trials

11.10.D.2.1 All welds must be non-destructively tested. One 100% visual test by a level 2 technician.

11.10.D.3 Certification

11.10.D.3.1 The non-destructive testing technician must be certified level 2 for UT tests.

11.10.D.3.2 The construction materials used must be approved by a recognized classification society.

11.10.D.4 Documentation

11.10.D.4.1 Certificates of materials used

a) Carpets
b) Marine cement and all components used
c) Wall panels
d) Rock insulation
e) Vapour barrier membrane with 0% permeability and consumables.

11.10.D.4.2 Calibration certificate of the thickness reading technician.

11.10.D.4.3 A report of thickness readings must be submitted no later than 1 week after the beginning of the work period.

11.10.D.4.4 A contractor's report that shows: the room temperature during the application of the floor covering at all stages, i.e., one reading prior to the start of installation and one every 6 hours until the product has dried. The report must also include allowable product application temperatures.

11.10.D.4.5 A contractor's report including room temperature, steel temperature and humidity when paint is applied to exterior partitions before and after each coat of paint is applied.

11.10.D.5 Training[– Not Used]

12.0 Propulsion and Manuevering [- NOT USED]
13.0 Power Generation Systems[- NOT USED]
14.0 Power Distribution Systems[- NOT USED]

15.0 Auxiliary Systems
15.1 PIPING RENEWAL

15.1.A Identification

15.1.A.1 The purpose of this specification is to perform the replacement of thinned or corroded galvanized steel pipes in the machine area.

15.1.B References

15.1.B.1 Equipment Data

Table 1: Piping replacement

item	référence du tuyau	Fluide	approx OD	approx LOA	Fittings	Brides	Notes de dessin
1	AC 2&3 Eau de mer du pont supérieur	Eau de mer	5"	10'	2 x 45 degree	2 x 8 trou	
2	Génératrice no 2 (refoulement d'eau mer connection vers salle de prop seabay)	Eau de mer	5"	12.5'	3x 90 degree, tuyau 2.5' et bride soudé en T avec tuyau principale	2 x 8 trou, 1 x 4 trou	DA. piping ASTM A53-73T Sch 40 5", T connection 2", flanges steel 150 lb. ASA standard slip on weld type
3	recirculation alternateur DP3 (après valve sortie)	eau de mer	2.5"	10.5'	2 x 90 degree (angle doux)	2 x 4 trou	piping ASTM A53-73T Sch 40 2", flanges steel 150 lb. ASA standard slip on weld type
4	Tunel de quille - ligne bouchain	bouchain	8"	8'	2 x 90 degree	2 x 8 trou	ASTM A53-73T seamless grade A Sch 40 double galvanized

5	redresseeur (DP1-2) situé avant DP1	eau de mer	3"	8'	2 x 90 degree, 4 x 45 degree	2 x 4 trou	piping ASTM A53-73T Sch 40 2.5", flanges steel 150 lb. ASA standard slip on weld type

15.1.B.2 Drawings

15.1.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
221-670-4_01	S.W. circ. Syst. Piping arrgt. Rev 6	1
221-670-4_02	S.W. circ. Syst. Piping arrgt. Aft. Eng. Room Rev 9	1
221-670-4_03	S.W. circ Syst. Piping arrgt. Motor room rev 5	1
221-670-2	S.W. Circ System Diagram Rev 3	

15.1.B.3 Regulations and Standards

15.1.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
ASME IX		
ASTM A53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	Non
ASTM A139-16	Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)	Non
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products	Non
ASTM A530	Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe	Non

ASME B31.3	Code for pressure Piping – Chemical Plant and Petroleum Refinery Piping.	Non
ASTM F708-92 (reaprproved 2018)	Design and installation of rigid pipe hangers	Non
Regulations		

15.1.C Statement of Work

15.1.C.1 Replacement

15.1.C.1.1 During the manufacture of the replacement pipes, the flanges of the pipe remaining on the vessel must be blocked with blind flanges and gaskets so that there is no possibility of liquid flow.

15.1.C.1.2 The contractor must reproduce the pipe sections as described in Table 2: Pipe to be replaced.

15.1.C.2 Seawater Piping Fabrication

15.1.C.2.1 The contractor must provide seamless seamless ASTM A53-73T Grade A piping, Schedule 40. For seawater piping identified in Table 2: Pipe to be replaced. Type Std #150 flanges.

15.1.C.3 Pipe Replacement

15.1.C.3.1 The piping must be painted outside only with a paint system adapted to the material. Two coats of marine paint in addition to one coat of primer must be applied.

15.1.D Proof of Performance

15.1.D.1 Inspection Points

15.1.D.1.1 The contractor must provide a visual inspection report of the interior and exterior of all pipe. The inspection must be performed by a level 2 or 3 welding inspector. Acceptability criteria are those of ASME Section IX. The welding inspector is hired by the contractor.

15.1.D.1.2 The contractor must present the galvanized piping to the Technical Authority prior to installation.

15.1.D.1.3 Hold Point: An inspection of the root weld must be made by the weld inspector. A 48 hour notice must be given to the technical authority to see the first weld pass.

15.1.D.2 Testing/Trials

15.1.D.2.1 A hydrostatic test at a pressure of 80 psi for 30 minutes must be done for each section of pipe. This test must be performed in the presence of the technical authority prior to galvanizing. 48 hours notice must be given to the technical authority.

15.1.D.2.2 The contractor must test all systems where piping has been disturbed. The crew will perform the operation and start-up of the equipment.

15.1.D.3 Certification[– Not Used]

15.1.D.4 Documentation

15.1.D.4.1 The visual weld inspection report must be submitted to the Technical Authority prior to the galvanizing of the pipes. Ref: 15.1.D.1.1

15.1.D.4.2 The certificates of qualification of the welding inspection personnel must be submitted to the technical authority before the galvanizing of the pipes.

15.1.D.5 Training[– Not Used]

15.2 GALLEY RANGE HOOD CLEANING AND CERTIFICATION

15.2.A Identification

15.2.A.1 Clean, repair and certify the galley range.

15.2.B References

15.2.B.1 Equipment Data

15.2.B.2 Drawings and Documents

15.2.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes .

Drawing Number	DRAWING TITLE	Number of Sheets

15.2.B.3 Regulations and Standards

15.2.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
Publications		
Standards		
Regulations		
	Canada Shipping Act and Regulations	

15.2.C Statement of Work

15.2.C.1 Clean and degrease the extractor duct from the kitchen hood to the suction grille located behind the emergency generator compartment. The duct of a rectangular section of 12 "X 32" has a horizontal segment of 36 feet, a bend of 90 degrees and a vertical segment of 27 feet. Two access hatches facilitate cleaning on the horizontal and vertical section.

15.2.C.2 Dispose of residues and leave the premises in the same state of cleanliness as it was found at the beginning of the work.

15.2.C.3 Check the automatic cleaning system of the range hood. Check the cleaning sequence, check that the system starts and stops at the times indicated as the cleaning cycle.

15.2.C.4 Inspect and clean the scuppers of the hood by the four access hatches on the top

15.2.C.5 Check that all the cleaning nozzles are working condition (4 pipes of 10 nozzles).

15.2.C.6 Make sure main drain pipe adequately functions.

15.2.C.7 Check the emergency shut-off mechanism.

15.2.D Proof of Performance

15.2.D.1 Inspection Points

15.2.D.1.1 The work must be inspected by the chief engineer of the vessel or his representative.

15.2.D.2 Testing/Trials

15.2.D.2.1 The automatic emergency shutter closing test must be certified by the chief engineer or his representative.

15.2.D.3 Certification

15.2.D.4 Documentation

15.2.D.4.1 Provide a certificate for the cleaning and inspection of the Galley Range hood and exhaust system.

15.2.D.5 Training[– Not Used]

15.2.D.5.1 [All training requirements.]

16.0 Domestic System

17.0 Deck equipment

17.1 PORT AND STARBOARD BARGE DAVITS

17.1.A Scope

17.1.A.1 Provide the material and labor required to perform the 5 year maintenance and certification of the port and starboard barge davits.

17.1.B References

17.1.B.1 Equipment Data

17.1.B.1.1 Wellin Lambie Davit

17.1.B.2 Drawings

17.1.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
Manuel	Manual Welin Lambie	

17.1.B.3 Regulations and Standards

17.1.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
7.B.2	Fall Protection	Yes
7.B.4	Hotwork	Yes
7.B.5	Lock Out/Tag Out	Yes
Publications		
Standards		
Regulations		

17.1.C Statement of Work

17.1.C.1 General

17.1.C.1.1 Provide the material and labor required to perform the following work on each of the barge davits.

a) Precise measurements of all mechanical components must be taken and submitted in the final report; this also includes measurements required on electrical components. This report must also include all certificates, hydraulic, electrical, electric motor, mechanical and painting firm reports, a description of the work performed and a list of parts replaced. This report must provided in PDF format to the chief mechanic at the end of the work. This report must also include all certificates and reports from firms specializing in hydraulics, electricity, electric motors, machine shop, paints, coatings, parts replaced. Detailed description of work performed. This report must be submitted to the IA, in PDF format, upon completion of the work.

b) All parts found to be defective and excessively worn must be replaced with equivalent parts, supplied by the Contractor. The Contractor must provide a price for the replacement of 8 pins, 4 pulleys and 8 bushings (bearings). The price must be given for a replacement using 4140 steel.

i) Pin: 3 inch diameter, 6 inches long
ii) Pulley: 12 inch diameter
iii) Bushing: 2 ¾ inches long, ½: thick

17.1.C.1.2 The Contractor must provide cranage and scaffolding.

17.1.C.1.3 Work can begin once the ship`s crew has offloaded the barge.

17.1.C.1.4 Fore and Aft cables must be removed by the crew, before work begins.

17.1.C.1.5 The Davit must be electrically « Locked-out » on the MCC located in the scuba compartment. This must be done in presence of the ship’s Elctrical Officer.

17.1.C.1.6 Dismantling and removal of Sheaves and pins must be conducted in such a way, to ensure components are reinstalled in their original location. They must be identified according to the sketch provided.

17.1.C.1.7 Welds on the davit seating must be subjected to a magnetic particule inspection.by level 2 technician. Provide the report of these test. Surface preparation and testing must be included in the price. All exposed metal from testing must be coated with at least 2 coats of a marine paint system, including primer, that is compatible with the existing coating system. The current coating system is International Interbond 201 low temperature, Red (KDL274/A5GL), minimum dry thickness per coat of 6 mils (8.1 mils wet).

17.1.C.1.8 Lifting hooks must be dismantled, cleaned and inspected using the same procedure as the pins. They will not be tested unless repairs have been done. Repairs will be dealt with using the PWGS 1379 form.

17.1.C.1.9 Each pulley and sheave must be sand blasted to permit a visual inspection. All grease channels must be cleaned of old grease and proven free. Each pulley and sheave must be repainted with a paint system to comply with ISO 12944 category C5

Very High. The individual coats must be of different colors with a final coat of white RAL 9003. The pulleys on the deck must have final coat of red (KDL274/A5GL).

17.1.C.1.10 A dye penetrant inspection must be carried out to detect any cracks or anomalies on all mechanical components.

17.1.C.1.11 All pulleys must be inspected and measured. Particular attention must be paid the the inspection of the surface of the groove in contact with wire cable. Measurements must be taken in the presence of the IA.

17.1.C.1.12 The bronze bushings, pins and grease passages must be thoroughly cleaned and inspected. Replacement of parts found to be damaged must be carried out, based on the results of this inspection. Parts to be replaced will be negotiated using the PWGS 1379 form.

17.1.C.1.13 The Contractor must also remove and support the main spreader beam iin order to disassemble and inspect the two shackles. The weight of the beam is approximately 2 tons.

17.1.C.1.14 Two gearboxes, driving the luffing screws and all associated equipment must be opened for a complete inspection. Oil must be drained and disposed of; perform a complete cleaning. Gears and worm-wheels must be checked for cracks and wear; renew bearings and seals, reassemble gear boxes ans fill with new oil (Mobile SHC 629) supplied by the CCG. Parts to be replaced will be supplied by the Contractor and negotiated using the PWGS 1379 form.

17.1.C.1.15 The electric motors on the gear boxes must be sent to a specialized firm for cleaning and refurbishment. The selected subcontractor must provide a report of all work carried out and parts replaced. All motor bearings must be replaced with quality SKF bearing and must be sealed. Replacement parts must be supplied by the Contractor and will be treated using the PWGS 1379 form.

Manufacturer :	Laurence Scott & Electromotors Ltd
Serial Number :	21417A7 et 21417A8
RPM :	1160
Volt :	440/3/60
Insulation :	B
Bearings :	D.E. 6208/C3
	N.D.E. 6206/C3

17.1.C.1.16 Worm gear mechanisms must be disassembled, cleaned, inspected and reassembled with new bearings and seals. Replacement parts must be supplied by the Contractor and processed via a 1379 form. Before reassembly, present the parts to the IA for inspection.

17.1.C.1.17 Overhaul the brake and ratchet mechanism, renew linings and parts. Replacement parts will be supplied by the Contractor and processed using a 1379 form.Prior to reassembly, submit all parts to the IA for inspection.

17.1.C.1.18 Reassemble and connect davit components and parts according to the manufacturer's manual.

17.1.C.1.19 New cables will be supplied by the Canadian Coast Guard and installed by the ship's crew.

17.1.C.1.20 Verify that all grease points are clear. All components must be lubricated with grease (Petro-Canada PXL2C30, Precision XL EP2) supplied by the Contractor.

17.1.C.1.21 A second lubrification must be done taking care to set the components in motion during lubrication. This second lubrication must be done in the presence of the IA.

17.1.C.1.22 All the bolts, nuts and washers of the bases of the different equipment must be replaced by new parts of the same size and of grade 5.

17.1.C.1.23 The Contractor must adjust the fall tensioning system.

17.1.C.2 Control System

17.1.C.2.1 The Contractor must replace the limit switches with components to be supplied by the Contractor. The new davit control system must be designed by the Contractor with the new components and must be a system stamped by the Contractor`s Engineer. The components of the system must retain the same protective functions as the existing system.

17.1.C.2.2 The modified control system plan must be produced according to the CCG drawing template, see G 1.6 Drawings.

17.1.D Proof of Performance

17.1.D.1 Inspection Points

17.1.D.1.1 The Contractor must prepare an inspection plan which must be submitted to the IA.

17.1.D.1.2 All work must be completed to the satisfaction of the IA

17.1.D.2 Testing/Trials

17.1.D.2.1 After reinstalling all davit parts, make the necessary adjustments to ensure proper davit operation. The Contractor must demonstrate the proper operation of the davit to the IA. Particular attention must be paid to the adjustment and proper operation of the fall tensioning system. The Contractor must perform static and dynamic load tests at 110% of SWL in the presence of the IA.

17.1.D.2.2 The Contractor must coordinate with the Canadian Coast Guard a 10-hour sea trial for davit adjustments. The date of these trials will be determined at a later date. The Contractor must provide the labour and materials for the adjustments.

17.1.D.2.3 All safety controls/protections must be demonstrated to the IA.

17.1.D.3 Certification

17.1.D.3.1 The Contractor must provide a Certificate of Inspection (T2) to the IA.

17.1.D.3.2 The Contractor must provide the original copy of the Magnetic Particle Inspection Certificate.

17.1.D.3.3 The Contractor must also send an electronic copy of the certificates to the Technical Authority.

17.1.E Livrables

17.1.E.1 Documentation

17.1.E.1.1 The Contractor must provide the IA with a hard copy and an electronic copy (PDF) of the inspection report. Specific measurements of all components must be taken and recorded in a final report. The report must contain all work performed, the results of non-destructive testing and the parts replaced. The Contractor must send an electronic copy of the report to the Technical Authority.

17.1.E.1.2 Provide the T2 Inspection and test certificate.

17.1.E.1.3 Provide an updated drawing of the control system.

17.1.E.2 Training[– Not Used]

18.0 Communications and Navigation[- NOT USED]

19.0 Control Systems[- NOT USED]

20.0 Scientific, Oceanographic and Hydrographic Equipment

20.1 MULTIBEAM WIRE-GLAND REPAIR

20.1.A Scope

20.1.A.1.1 The Contractor must lift the multibeam HIPAP unit to allow the re-tighting of the wire gland at the bottom of the transducer tube and the installation of a second Sound Velocity Sensor (SVS).

20.1.B References

20.1.B.1 Equipment Data

20.1.B.1.1 The new SVS and wire are supplied by Coast Guard

20.1.B.1.2 The new modules for the Roxtex are supplied by the Contractor, the frame of the Roxtex remains in place.

20.1.B.2 Drawings

20.1.B.2.1 All Drawings are listed in the General Notes. The following Drawings are to be considered as Guidance Drawings as defined in the Drawings section of the General Notes.

Drawing Number	DRAWING TITLE	Number of Sheets
Kongsberg Equipment Drawings	Arrangement Drawing, "Outboard" EM16 Hull Unit 2.1 M EM 712 POD 2x2	1
	Micro X User Manual	28
424444	Hull Unit HL2900 EM712	1
424511	Transducer Pod Assembly EM712	1
424455	General Arrangement HL2900 EM	1
	Lifting lugs	

20.1.B.3 Regulations and Standards

20.1.B.3.1 The following Standards and Regulations apply to work carried out in this section; The Contractor must ensure all work completed in this section meets these Standards and Regulations as well as any other pertinent Federal/Territorial Regulation or Standard:

FSM Procedures	Title	Included Yes/No
7.B.4	Hotwork	Yes
7.B.1	Diving	
Standards		
Regulations		
TP 127	Ships Electrical Standards	No

20.1.C Statement of Work

20.1.C.1 Divers 2nd safety line

20.1.C.1.1 The Contractor must install a 2nd water barrier in the multi-beam tunnel to double the protection for the duration of the work. All Coast Guard diving procedures must be followed.

20.1.C.2 Manufacturer representative

20.1.C.2.1 The contractor must hire a manufacturer's representative to come on site to monitor the work.

20.1.C.3 Lifting of the EM-16 Hull Unit

20.1.C.3.1 The Contractor must lift the intermediate flange from the Mounting Trunk in order to free a 45 cm zone to be able to work. The Contractor must propose a safe way to secure the EM-16 Hull Unit for the work time other than only the chain falls.

20.1.C.3.2 The Contractor is responsible to test the lifting points before their use. A Certificate for each lifting points the Contractor uses must be given to the Technical Authority. A reference document lifting lugs.pdf is provided to view lifting arrangements.

20.1.C.4 Lower Wire Gland

20.1.C.4.1 The Contractor must remove from position the 9 threaded wire gland in place. They must be cleaned and re-installed with a thread sealant suitable for immersion.

20.1.C.4.2 The Contractor under the supervision of a manufacturer representative must split the transducer from the Hull Unit. This Operation will required to loosen all the cables to give some room for the separation of the transducer.

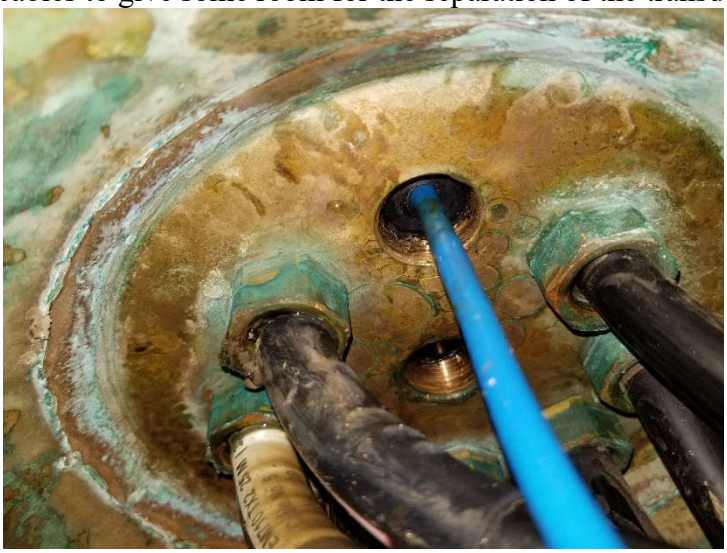

Figure 1: lower wire gland

20.1.C.5 Top Wire Gland

20.1.C.5.1 The Contractor must supply and install transit modules that are class approved and can be used in a Roxtex System R150. All the modules must be changed for new modules.

20.1.C.5.2 The Contractor must re-pack the Roxtex system as per manufacturer instructions.

20.1.C.6 New Sensor installation

20.1.C.6.1 The SVS is mounted on the transducer pod assembly which is attached to a ram and deployed through the hull of the ship. Details of this system can be seen in the

reference drawings 424444, 424511 and 424455. The actual mounting configuration is also shown in Figure 2: SVS mounting configuration on transducer pod assembly.

20.1.C.6.2 The Contractor must install a second SVS sensor on the Tranducer. A new wire must ran with the others and the wire glands must be routed in the adjacent compartment through a transit in the centreline bulkhead in to the junction box in the heeling compartment on the starboard side. The approximate length of this cable run is 12m.

20.1.C.6.3 When connecting the new SVS, the wiring must match the current configuration.

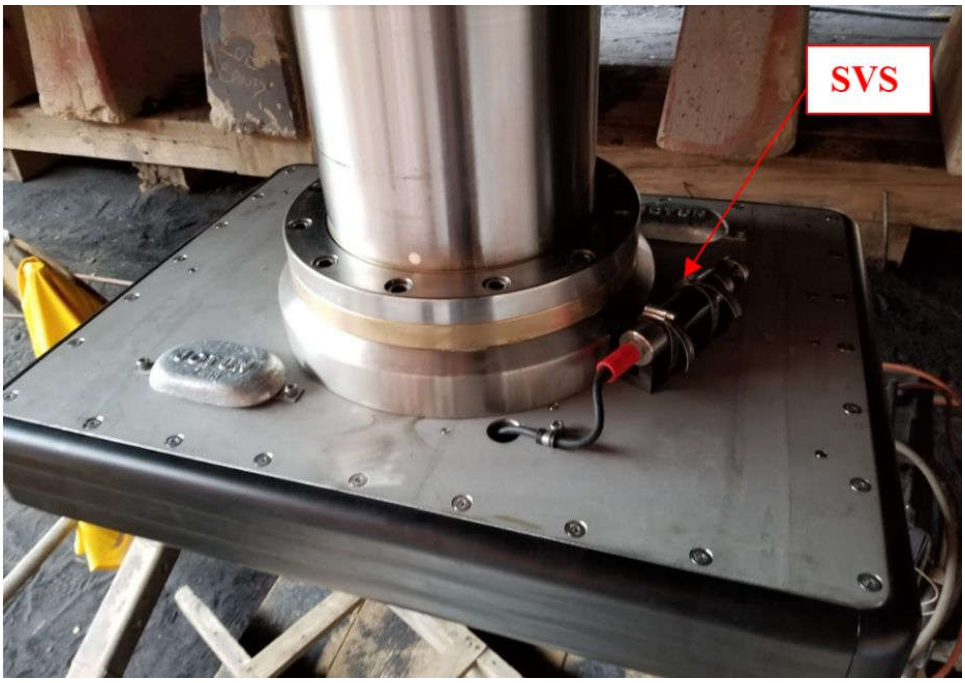

Figure 2: SVS mounting configuration on transducer pod assembly

20.1.C.6.4 To access the SVS cable from below the Contractor must remove the lower cover of the transducer pod assembly. To remove the cover the Contractor must remove a number of screws in the bottom panel. These screws must be retained as the bottom cover will be reinstalled after the two new SVS are installed. The Contractor must not remove the screws holding the transducers in place. The transducers are shown in *Figure 3: Bottom view of transducer pod assembly*. **The Contractor must take extreme caution to not damage the transducers when working around the pod assembly**. Upon removal of the lower cover both transducers must be fully enclosed and protected to prevent scratches, dents or other forms of damage while completing the remaining work.

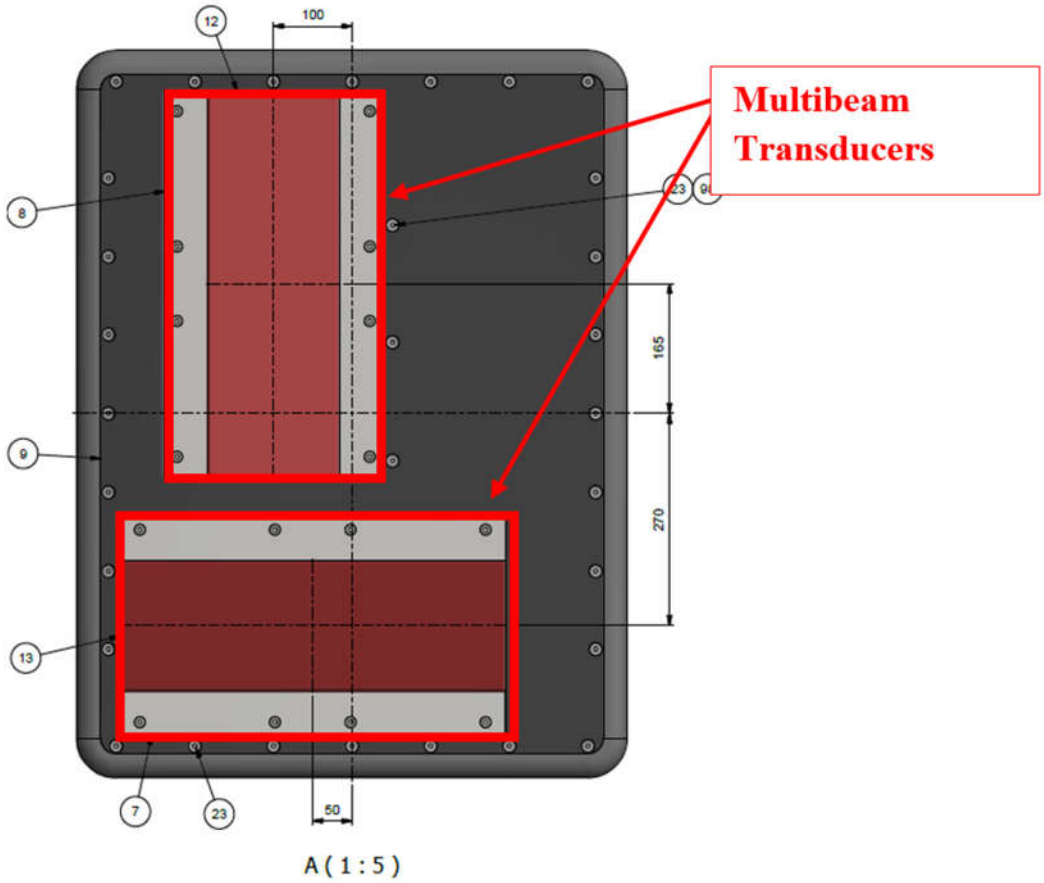

Figure 3: Bottom view of transducer pod assembly

20.1.C.6.5 To access the SVS cable from the top, the Contractor must remove the transit block which is installed at the top of the ram. The Contractor must take care when removing the transit block as any pieces which fall into the ram will be extremely difficult to remove. The transit block is shown in *Figure 4: Transit block on top of multibeam ram*:

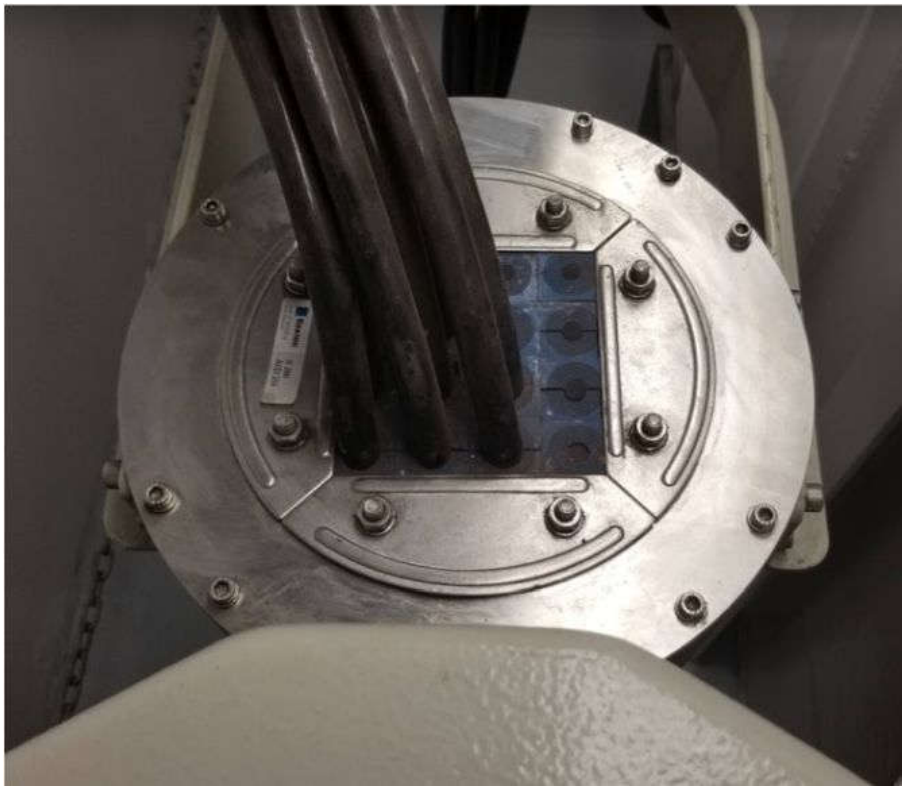

Figure 4: Transit block on top of multibeam ram

20.1.C.6.6 After opening the accesses for the SVS cable from above and below the ram the Contractor must add the cable for the new SVS. The cable passes from the transducer pod assembly, up through the ram, through the transit block at the top of the ram, through a second transit block supporting the cable and then through the transit in the centreline bulkhead separating the multibeam and heeling compartments. The cable terminates on the aft bulkhead of the heeling compartment, near the centreline. The total cable run is approximately 25m.

20.1.C.6.7 The Contractor must fabricate a second mounting base for the new SVS. This base must be fabricated from high-density polyethylene and secured to the transducer pod assembly with cap screws. The new mounting base must match the existing base both in terms of dimensions and mounting arrangement. The Contractor must also install two stainless steel hose clamps on the new mounting base to secure the SVS. The configuration of the mounting base can be seen in **Error! Reference source not found.**. The exact location of the new mounting base on the transducer pod assembly will be confirmed by CCG onsite.

20.1.C.6.8 The Contractor must run the new SVS cable from the mounting base on the transducer pod array, in through the available opening on top of the transducer pod assembly, and up through the hollow deployment ram. The cables will then travel through the support transit, inboard through the transit at the forward edge of the centreline bulkhead and then aft to the SVS junction box in the heeling compartment. The Contractor must connect one of the SVS sensors within the junction box.

20.1.C.6.9 The contractor must mount the second CVS on its mounting bracket and connect each to its cable.

20.1.C.6.10 Upon installation of the new SVS and associated cabling the Contractor must remove the protection installed on the transducers and reinstall the covering plate with all screws.

20.1.C.6.11 The Contractor must reinstall the three transits affected by the installation. The transit at the top of the deployment ram, the cable support transit and the centreline bulkhead transit between the multibeam and heeling compartments.

20.1.C.7 Limit switches

20.1.C.7.1 The Contractor must assist the manufacturer representative in the ajustment of new limit switches. The material will be supply by the Canadian Coast Guard.

20.1.D Proof of Performance

20.1.D.1 Inspection Points

20.1.D.1.1 The Chief engineer must see the lower wire gland before the dismantling.

20.1.D.1.2 The Contractor must document the as found condition.

20.1.D.2 Testing/Trials

20.1.D.2.1 The Contractor must apply a low air pressure to the drain valve and confirm integrity with a soap solution on the wire glands.

20.1.D.2.2 The CCG will confirm the functionality of the two SVS prior to the Contractor closing the transits and bottom cover of the transducer pod assembly.

20.1.D.3 Certification

20.1.D.4 Documentation

20.1.D.4.1 The Contractor must provide a detailed report explaining the work performed, including the as found condition.

20.1.D.5 Training[– Not Used]

21.0